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AUTOMOTIVE INDUSTRIES

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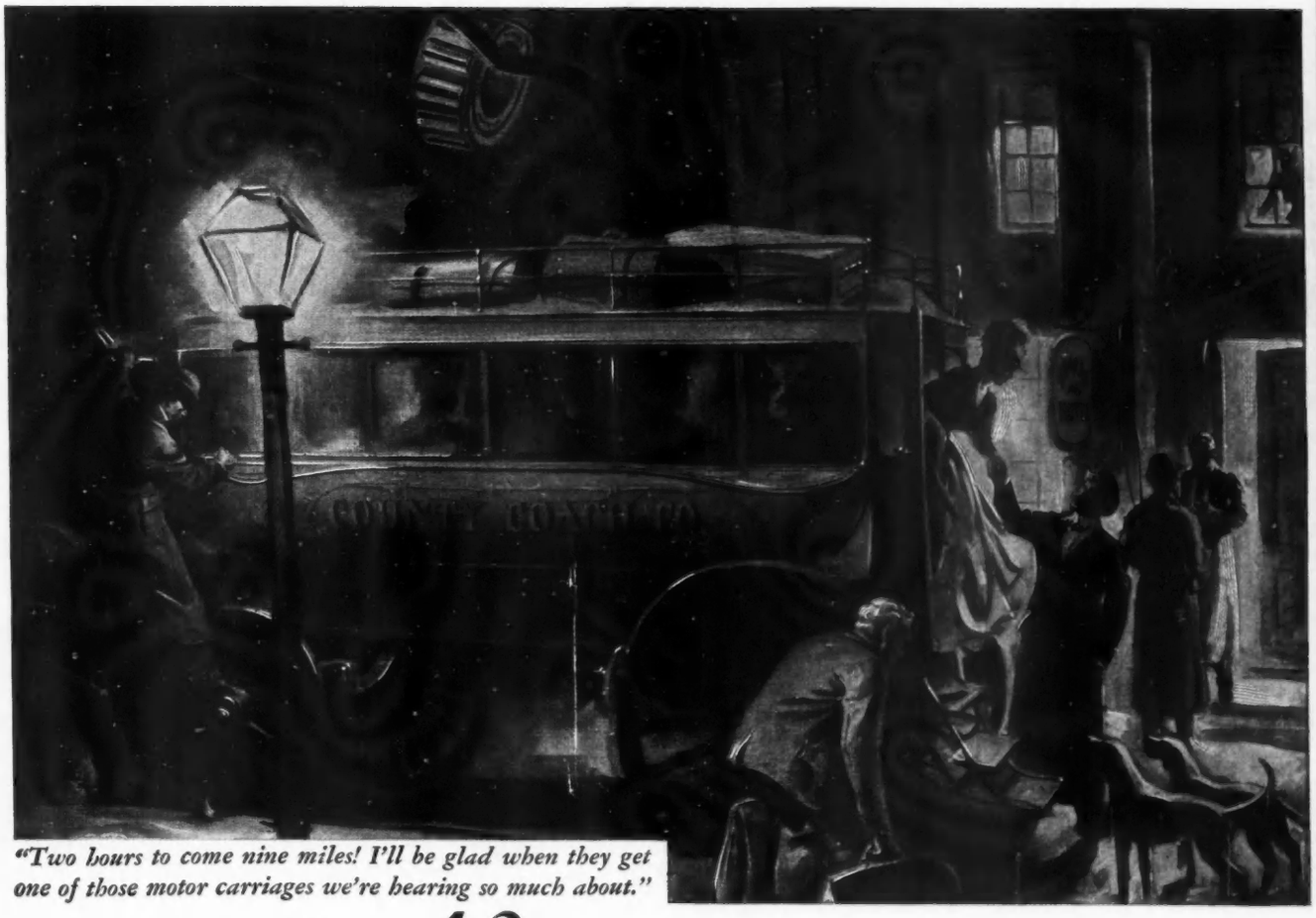
OCTOBER 1, 1938



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40 years ago

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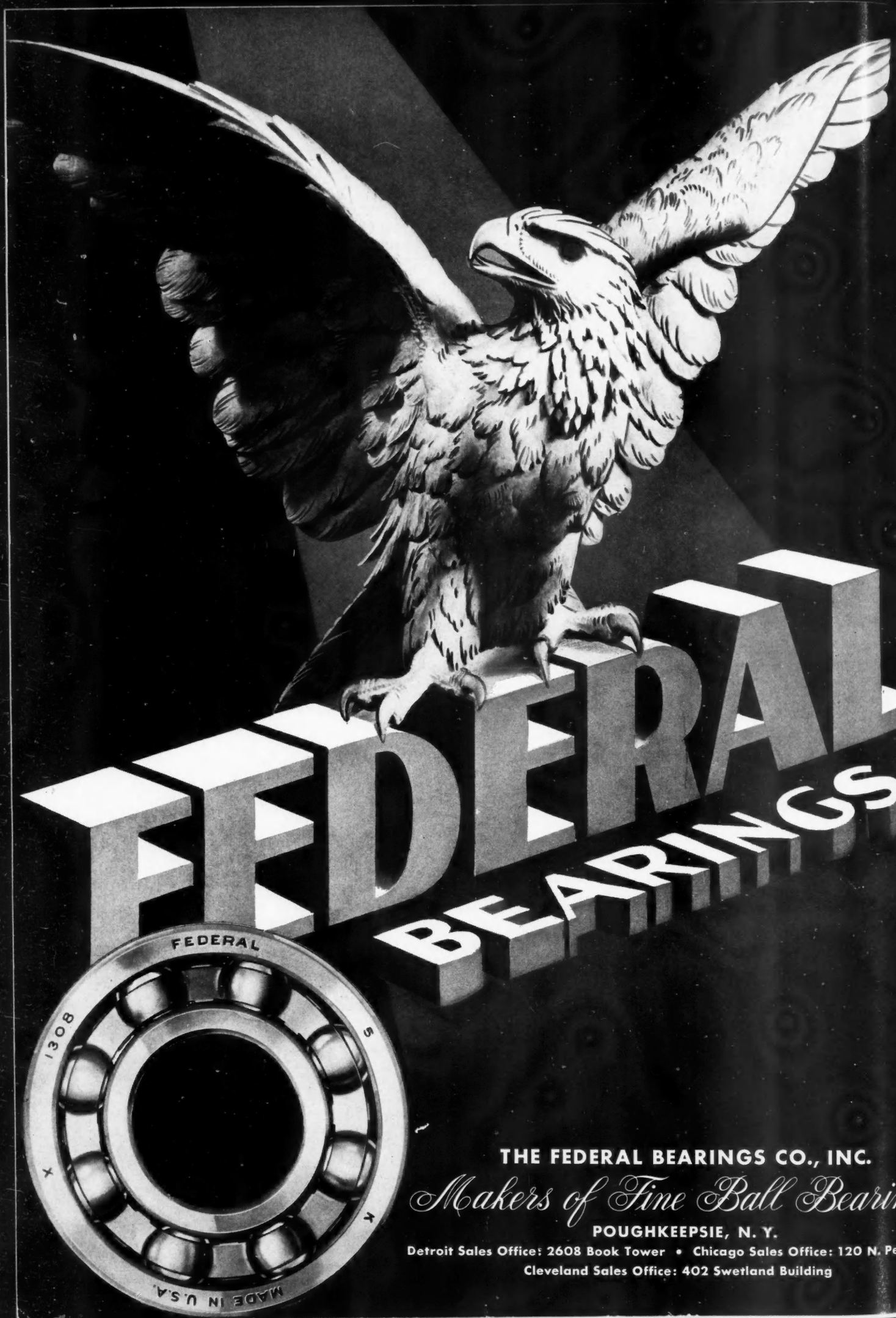
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And yet, she has this much in common with the old Spirit of St. Louis and with every other ship that ever took off on a successful transoceanic flight: She made it on SKF's!

On the long list of aircraft that have been SKF-equipped appear such world-renowned names as the Spirit of St. Louis, the Columbia, the America, the Question Mark, the Winnie Mae, the Martin Clipper Ship and planes of the great air transport companies and of the United States Army and Navy. SKF Industries, Inc., Front Street and Erie Avenue, Philadelphia, Pa.

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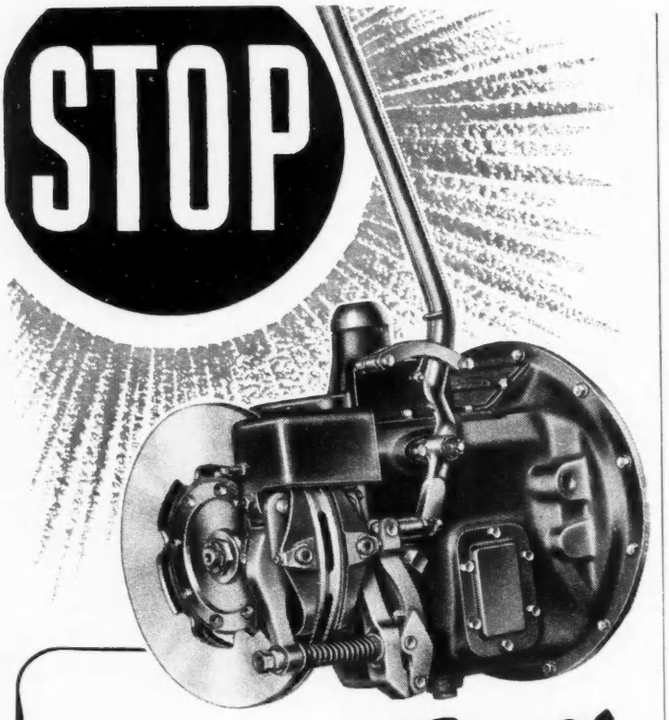

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Reg. U. S. Pat. Off.
Published Weekly

Volume 79 Number 14

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AUTOMOTIVE INDUSTRIES

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October 1, 1938

NICHOLAS FODOR

. . . named vice-president in charge of engineering of the Diesel Equipment Corp., designers and manufacturers of Deco Fuel Injection Equipment. For the past four years, Mr. Fodor has been associated with the Allis-Chalmers Mfg. Co., Milwaukee, as engineer in charge of oil engine development work.

Studebaker Shaves Prices On 1939 Models

Studebaker Corp., has announced prices of its new 1939 line. The State President model is reduced $95 from the 1938 level, and the State Commander, six-cylinder model, is reduced to the price of last year's regular Commander.

Factory delivered prices are:

State Commander	1939	1938
3-pass. business coupe	$875	....
3-pass. custom coupe	900	$965
Club sedan	955	1,030
Cruising sedan	965	1,040
State President		
3-pass. custom coupe	1,035	1,130
Club sedan	1,100	1,195
Cruising sedan	1,100	1,205
Convertible sedan	1,460	1,555

Production

Output 5000 Ahead of Last Week As '39 Assemblies Increase

Car and truck production during the final week in September took another upward step over the previous week, according to a preliminary survey of factory schedules. Most of the increase can be attributed to acceleration of pace by manufacturers already well under way on 1939 model production although the week also saw new entrants beginning final assembly lines on new models.

Production for the week should approximate 28,400 cars and trucks, roughly a 5000 gain over the revised estimate of 23,500 for the previous week. On the basis of these preliminary estimates total production for September should be slightly over 91,000 cars and trucks. This compares with actual U. S. and Canadian production of 96,936 cars and trucks during August according to figures currently released by the U. S. Department of Commerce.

Comparison of September and August production totals makes it evident that the industry generally is getting off to an earlier start this year on its new models. September production this year comes fairly close to that of August while in previous years September production has been materially lower than August.

The past week saw Oldsmobile get under way on its new line of cars and all passenger car divisions of General Motors are now turning out new models. Buick during the past

(Turn to page 421, please)

AUTOMOTIVE INDUSTRIES

Summary of Automotive Production Activity
(Week Ending Oct. 1)

BUSES While present conditions are generally reported "dull," there are many who believe that this business will brighten soon.

TRUCKS Sales curves of leading companies are climbing. One manufacturer reports activity bolstered particularly by orders from large fleets. Prospective buyers are probably holding orders in abeyance until they examine offerings at New York Truck Show.

TRACTORS "Seasonal lull" is reason given for sluggish business. Spokesman for one plant says, "anything can happen and we are sitting tight for the moment making up only what is needed for immediate demands."

AUTOMOBILES More producers joining those already underway on 1939 model assemblies brought the current week's output 5000 ahead of the week preceding to total approximately 28,400 cars and trucks. Based on this estimate, the September total should amount to about 91,000.

MARINE ENGINES Export business is especially good in several instances. Future uncertain because of tense European situation.

AIRCRAFT ENGINES Several manufacturers have plans well organized for quickly getting into production on fairly high-output units in case of accelerated demand abroad. (Latest high-powered units have not been released for domestic or export sales by the Army or Navy) Both production and research are proceeding at top speed.

This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.

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Passenger Car and Truck Production

Influenced by change over activity in many plants, August output in the U. S. and Canada dwindled to a low for the year of 96,936 cars and trucks. Compared with the figure for the preceding month, this amounts to a decrease of approximately 35 per cent. Last year the production of cars and trucks during August aggregated 405,072 units, and the percentage decrease of the figure for August, 1938, as compared with this total amounts to roughly 76 per cent. For the eight months of 1938 as compared with the similar period during 1937, the percentage decrease is about 59 per cent.

	August 1938	July 1938	August 1937	Eight Months 1938	Eight Months 1937
Passenger Cars—U. S. and Canada					
Domestic Market—U. S.	53,955	96,975	299,496	978,015	2,777,276
Foreign Market—U. S.	4,669	9,856	11,960	123,967	181,567
Canada	3,063	5,273	5,814	84,438	115,150
Total	61,687	112,114	317,270	1,186,420	3,073,993
Trucks—U. S. and Canada					
Domestic Market—U. S.	23,250	26,483	64,514	239,833	529,493
Foreign Market—U. S.	8,610	8,113	18,360	93,980	133,260
Canada	3,389	3,734	4,928	33,179	42,104
Total	35,249	38,330	87,802	366,992	704,857
Total—Domestic Market—U. S.	77,205	123,458	364,010	1,217,848	3,306,769
Total—Foreign Market—U. S.	13,279	17,979	30,320	217,947	314,827
Total—Canada	6,452	9,007	10,742	117,617	157,254
Total—Cars and Trucks—U. S. and Canada	96,936	150,444	405,072	1,553,412	3,778,850

August Tractor Shipments Down 17% From Same Month in 1937

Shipments abroad of tractors and parts during August were valued at $4,466,328, 17 per cent below the figure for August, 1937, of $5,387,340, the Machinery Division, Department of Commerce, has reported.

Wheel tractor exports, valued at $2,282,335, were down 5 per cent from the 1937 figure of $2,412,001. Shipments in the three classes of wheel tractors compared with a year ago were as follows: 14 belt hp. and under, $80,267 against $119,943; 15-32 belt hp., $1,396,874—$1,559,874; while larger sales were made in the 33 and over belt hp. sizes, $805,194—$732,184.

Valued at $1,367,999, the August, 1938, foreign sales of tracklaying tractors were 39 per cent below the corresponding figure for last year of $2,248,367. In this group, exports of the carburetor type, valued at $459,704, showed the sharpest drop, 51 per cent below the August, 1937, figure of $938,333. All three classes of the carburetor type shared in the decline, as follows: under 35 drawbar hp., $406,861 as compared with $854,642 for August of last year; 35-59 drawbar hp., $33,549 — $42,469; 60 and over drawbar hp., $19,294—$41,222. Foreign sales of the fuel injection type were 31 per cent lower, $908,295 compared with $1,310,034 in August, 1937, despite a gain of 162 per cent in the smaller size class (under 35 drawbar hp.) to $187,945 from $71,700 a year ago. The corresponding figures for the other classes were as follows: 35-59 drawbar hp., $379,366 against $781,727; 60 and over drawbar hp., $340,984—$456,607.

The exports of tractor parts and accessories increased 17 per cent, to $801,061 compared with $682,265 for August, 1937.

Poland to Produce Artificial Rubber

The manufacture of artificial rubber, known under the Polish patents as "Ker," is about to be started in Poland, according to a statement by the Polish Chemical Association reported to the Department of Commerce by the office of the American Commercial Attache at Warsaw. A large building for housing the project has been constructed at Debica, located in the newly designated Central Industrial District of Poland. The capital of the new organization was reported to be approximately $209,000.

Sources in Poland claim that if full plant capacity is achieved the production cost of synthetic rubber will amount to about 65 to 75 per cent of the cost of imported natural rubber, including customs duties. However, it was not expected that the maximum capacity will be reached, according to the report.

Committee Prepares Standards for Vehicle Inspections

Proposed standards for automobile inspection by the police authorities of the various states are now being prepared by a Sectional Committee on Inspection of Motor Vehicles under the procedure of the American Standards Association. Brakes, lights, steering gears, tires, accessories and wheel alignment are being studied by subcommittees of the main committee. It is hoped that when the work is completed the proposed inspection methods will be applied by the various states which now require inspection.

Four subcommittees of the Sectional Committee on Inspection of Motor Vehicles are now actively at work. These are:

Lighting Systems, W. F. Little, Electrical Testing Laboratories, chairman;

Tires and Wheel Alinement, William Heinrich, National Conservation Bureau, chairman;

Control (including brake systems), A. J. Schamehorn, Society of Automotive Engineers, chairman;

Accessories and Miscellaneous,

JALLOPIES

lined up for test run before revived Vanderbilt Cup race at Pasadena, Calif., during Golden Anniversary celebration. Dressed in traditional dusters, caps, goggles, the official starter is Barney Oldfield and Earl Cooper, both famous race drivers. The contestants and their entries are Fire Chief E. F. Coop in an Oldsmobile; C. B. Scovill, Jr., Oldsmobile; George V. Dill, Cadillac; T. M. Wright, Sears-Roebuck, and Paul Branch, Maxwell.

Soibelman

Dave Fenner, Automobile Manufacturers Association, chairman.

The committee is working under the leadership of the American Association of Motor Vehicle Administrators and the National Conservation Bureau. Sidney J. Williams of the National Safety Council is chairman; Dr. Miller McClintock, Bureau of Street Traffic Research of Yale University, and Arthur Magee, American Association of Motor Vehicle Administrators, are vice-chairmen. Harold F. Hammond, Institute of Traffic Engineers, is secretary.

Motorists in U.S. Have Three-to-One Edge Over Those in Britain

Returning from a two months' study of British highway safety measures, John M. Lessells, professor of mechanical engineering at Massachusetts Institute of Technology, claims that American traffic safety precautions give domestic motorists a 300 per cent "life expectancy edge" over British motorists.

Outlining his findings to Charles S. Hart, director of the Elks Traffic Safety Campaign, Professor Lessells said his study of highway conditions in England and Scotland reveals that one out of every eight automobiles in Britain is involved in a fatal or serious accident each year, while American averages show only one accident for every 25 cars. The 3-to-1 accident ratio persists, Professor Lessells said, despite the fact that the United States has 25,342,000 automobiles to Britain's 1,839,000.

Nearly 2500 Ford Employes Enroll in Company School

Nearly 2500 employes, ages 19 to 70, have been enrolled for the fall term of the Ford Apprentice School. The courses offered range from elementary shop mathematics to metallurgy, physics, and trigonometry. Three new courses this year are to be given on the subjects of body designing, hydraulics, and rubber.

The Apprentice School is one of three conducted in the Rouge plant. Another is the Henry Ford Trade School, which has more than 1700 boys, ranging in age from 13 to 19, enrolled. The third is the Training School, in which approximately 200 recent high school graduates are given short practical courses in engine repair, electrical work, and similar subjects.

Ford's vocational schools were described in an article by Harold E. Gronseth, which appeared in the Aug. 29, 1936, issue of AUTOMOTIVE INDUSTRIES.

HUPP FOR '39 will offer two Junior models—a six and a four—in addition to its Senior line. The Junior six has a chassis of the conventional rear-drive type, but bodies—as will be noted from the picture above—are similar in design to those fitted to Cord cars in the past.

Cord Influence Evident in '39 Hupp

Senior Models Supplemented by New Junior Six With Conventional Rear-Drive Type Chassis and Body Similar to Cord

Hupp Motor Car Co. plans to market two Senior models—a six and an eight—and two Junior models—a six and a four—during 1939. Senior-line models are essentially the same as those marketed by Hupp in 1938, but a number of detail improvements have been made. We are informed that prices on the Senior models will be materially lower than in 1938, but actual figures are not yet available.

At the coming national automobile shows, in addition to the Senior models, Hupp plans to show for the first time the new Junior Six, a car with a wheelbase of 115 in. and powered by an L-head engine of 3½-in. bore by 4¼-in. stroke, which is rated 101 hp. The chassis is of the conventional rear-drive type, but bodies will be similar in design to those fitted to Cord front-drive cars in the past, the sheet metal parts being made from dies which Hupp bought from Cord. These same bodies will be used on the four-cylinder line, which will come along later. The weight of the new Six is only 2900 lb., and the 101-hp. engine is said to give it remarkable acceleration.

Both the Junior Six and the Four will at first be available in two five-passenger types, to be known as the sports type and the custom type. The difference between the two lies in more comprehensive equipment for the custom type, the extra "custom" equipment including no-draft ventilation, a banjo-type steering wheel, a column-mounted shift lever, a new type of horn, a clock, and an additional accessory group. Later a convertible sedan and a convertible coupe body will also be offered on the six-cylinder chassis. All models will be equipped for the installation of radios, and an option on any one of five different body colors will be given purchasers. Both bodies will be available in either Mohair or Bedford Cord upholstery at the option of the customer. Over-drive is an optional extra on all models.

Turning to the Senior line, among the improvements in these continued chassis models is the removal of the shift lever from the floor to the steering column, thereby eliminating obstructions from the front compartment. Instrument panels are now in the form of moldings. The instrument board consists of a Walnut-grained frame which carries five sections of translucent plastic in a two-tone combination. This color effect is set off by that of two-tone plastic in the steering wheel. Door handles and window cranks carry out the color scheme. The center panel of the instrument board forms a radio-speaker grille about which the instruments are assembled. Provision is made for the installation of a defroster.

Senior Hupmobiles are offered on two chassis, the Six having a wheelbase of 122-in. and the Eight a 125-in. wheelbase,. The six-cylinder engine is rated 101, and the eight-cylinder 125 hp. Both chassis will be available with six-passenger touring-sedan bodies with either deluxe or custom equipment. The custom model comes with built-in radio (insulated-top aerial), optional upholstery material, and a full complement of accessories.

MEN OF THE INDUSTRY

A. W. CHILDS, former chief of the automotive division, Bureau of Foreign and Domestic Commerce, and now assistant commercial attaché at Rio de Janeiro, is in the United States for a period of about four months, during which he will carry out a tour of duty which will take him to many domestic offices of the Bureau for local conferences on Brazilian conditions. Following the duty tour he and his family will travel by automobile through the Western states.

WILLIAM L. BATT, president of SKF Industries, Inc., Philadelphia, the first American to hold the office, was named president of the International Committee of Scientific Management last Friday in Washington at the conclusion of the meeting of the Seventh International Management Congress. He will serve throughout the next triennial International Management Congress which will be held in Stockholm, Sweden, in 1941. Mr. Batt succeeds the Right Honorable Viscount Leverhulme of England.

C. B. THOMAS and **B. C. BUDD,** members of the export committee of the Automobile Manufacturers Association, sailed Sept. 22 on the *Queen Mary* for Paris where plans for the further expansion of automotive trade with European nations will be discussed with foreign representatives of the American factories. Another representative of the AMA committee, who sailed last week on the *Washington* is **H. M. SALISBURY,** export sales manager, Nash Motors Division of the Nash-Kelvinator Corp. Mr. Thomas is general sales manager of the Chrysler Corp., export division, and Mr. Budd is vice-president of the Packard Motors Export Corp.

E. F. TOMLINSON, until recently in the Chicago office of the B. F. Goodrich Co. manufacturers' sales department, has been transferred to Milwaukee, Wis., in charge of manufacturers' sales. **JOHN F. REND,** sales supervisor for Goodrich in the Buffalo, N. Y., district, also goes to the Milwaukee office. **P. E. TOBIN,** manufacturers' sales department in Akron, and **J. T. CALLAHAN,** sales supervisor in the New Orleans, La., district, replaces him on the Akron staff. **H. H. BRYANT** has been named manager of the manufacturers' sales department in Akron.

WILLIAM A. BAKER has been appointed manager of the national used car sales department of the Hudson Motor Car Co. Another new appointee is **C. W. TREADWELL,** who recently joined the sales development department. Both Mr. Baker and Mr. Treadwell will be located at the factory in Detroit.

J. HERBERT NEWPORT, JR., industrial designer, recently established a new office at the New Center Building in Detroit. For the past year Mr. Newport has been working with George W. Walker of the Nash-Kelvinator Corp. in the development of 1939 styling for Nash and Lafayette cars. Prior to this connection, he was for three years chief designer for Duesenberg, Inc., at which time he designed and supervised the building of the body for Ab Jenkins' "Mormon Meteor", and assisted with the design of the Auburn and Cord cars.

LORD NUFFIELD, the British motor magnate who already controls quite a number of firms in the automobile industry of Britain, has bought the assets and goodwill of Riley (Coventry), Ltd., from the receiver. It is understood that the business will be resold to Morris Motors, Ltd., the principal one of Lord Nuffield's automobile enterprises, and that Victor Riley will be appointed managing director.

ROY S. EVANS, president of the American Bantam Car Co., has just returned to Butler, Pa., from a tour of Bantam distributorships in the West. While on the Coast Mr. Evans opened a Los Angeles office under the managership of Howard L. Elliott.

Charles E. Duryea Dies at 76

Pioneer Builder of Motor Vehicles Succumbs to Heart Ailment at His Home in Philadelphia on Sept. 28

Charles E. Duryea, generally recognized as the pioneer of the American automobile industry, died at his home in Philadelphia on Sept. 28 at the age of 76. He had been ill for some time, suffering from a heart ailment and other complications. He is survived by his widow, Mrs. Rachel Steer Duryea; two daughters, Rhea, widow of W. Harvey Johnson, and Grace Louise Duryea; a son, Merle Junius Duryea, of Springfield, Mass.; two brothers, J. Frank and Otho C. Duryea, and two sisters, Mrs. Herbert J. Nielson and Mrs. Blanche Gilfillan. The following account of Mr. Duryea's life was written by P. M. Heldt, engineering editor of AUTOMOTIVE INDUSTRIES, who knew him before the turn of the century. Mr. Heldt, in fact, attended the Chicago *Times-Herald* race in 1895 which was won by a Duryea car.

Charles E. Duryea was born on a farm near Canton, Fulton County, Ill., on December 15, 1861. In 1882 he graduated from Gitting's Seminary, La Harpe, Ill., and it is of interest that his graduation thesis, which bore the title "Rapid Transit Other Than on Rails" dealt not only with motor-propelled road vehicles but also with flying machines, and predicted "half-day jumps" to Europe.

Shortly after graduation he entered the bicycle business in St. Louis, Mo., and later he opened a bicycle store in Washington, D. C. The bicycle at that time was still in a primitive stage and offered a fertile field for inventive abilities. Duryea patented a suspension saddle, a women's drop frame, a "side-by-side" bicycle and a spring frame. In 1888 he organized the Duryea Manufacturing Company in Washington, D. C., to manufacture a bicycle built around the spring frame of his invention, but just about that time the pneumatic tire became available and eliminated the need for the spring frame.

In 1891 Duryea went to Springfield, Mass., and for some time was engaged as bicycle inspector at the plant of the Ames Mfg. Co., in nearby Chicopee Falls. It is said to have been during a period of shut-down at this plant that he and his brother, Frank, began work on their first gasoline-engined vehicle. This car, which was equipped with a single-cylinder engine set on edge, that is, with the crankshaft vertical, is said to have been completed in October, 1892. It proved to be underpowered and was dismantled, and work was started immediately on a second one, which was equipped with a Nash two-cylinder engine, a differential gear taken from a tricycle, bicycle chains for the final drive, and other bicycle and carriage parts. This car, which was completed in 1893, is now in the Smithsonian Institution Museum in Washington.

There is some uncertainty regarding the exact dates when work on the earliest cars was started and when the cars were finished. This, of course, is more or less natural, as men engaged in such work usually do not keep diaries; they do not realize that they are making history and are concerned only with the problems that call for immediate solution—of which the horseless carriage presented many. What is supposed to have been the first mention of the Duryea motor vehicle in the public press appeared in the Springfield *Evening Union* of Sept. 16, 1893.

In 1893, after a visit to the World's Columbian Exposition at Chicago, where a Sturgis electric and a Daimler gasoline automobile were on exhibition, the brothers started work on their third car, which they finished during the winter of 1894-5. In Sept., 1895, the Duryea Motor Wagon Company was organized at Springfield, Mass., to manufacture this vehicle. Two cars were prepared for the Chicago *Times-Herald* race, which was held on Thanksgiving Day, 1895, but only one participated, and it won the event. This race was run over a 55-mile course starting at Jackson Park on the South Side of Chicago, running up the Lake Shore to Evanston, and returning to Jackson Park over another route through the West-Side park system of the city. It was run under extremely unfavorable conditions, as the streets were covered with about 6 in. of snow, which during a preceding cold spell had been worked up by the traffic into a mass not unlike fine sand in consistency. Skid chains, of course, were unknown at the time. The winning car, driven by J. Frank Duryea, covered the 55 miles in 10 hours 28 minutes. It was equipped with a two-cylinder nearly horizontal engine arranged under the seat, which had a rating of 4 hp. This car was fitted with pneumatic tires

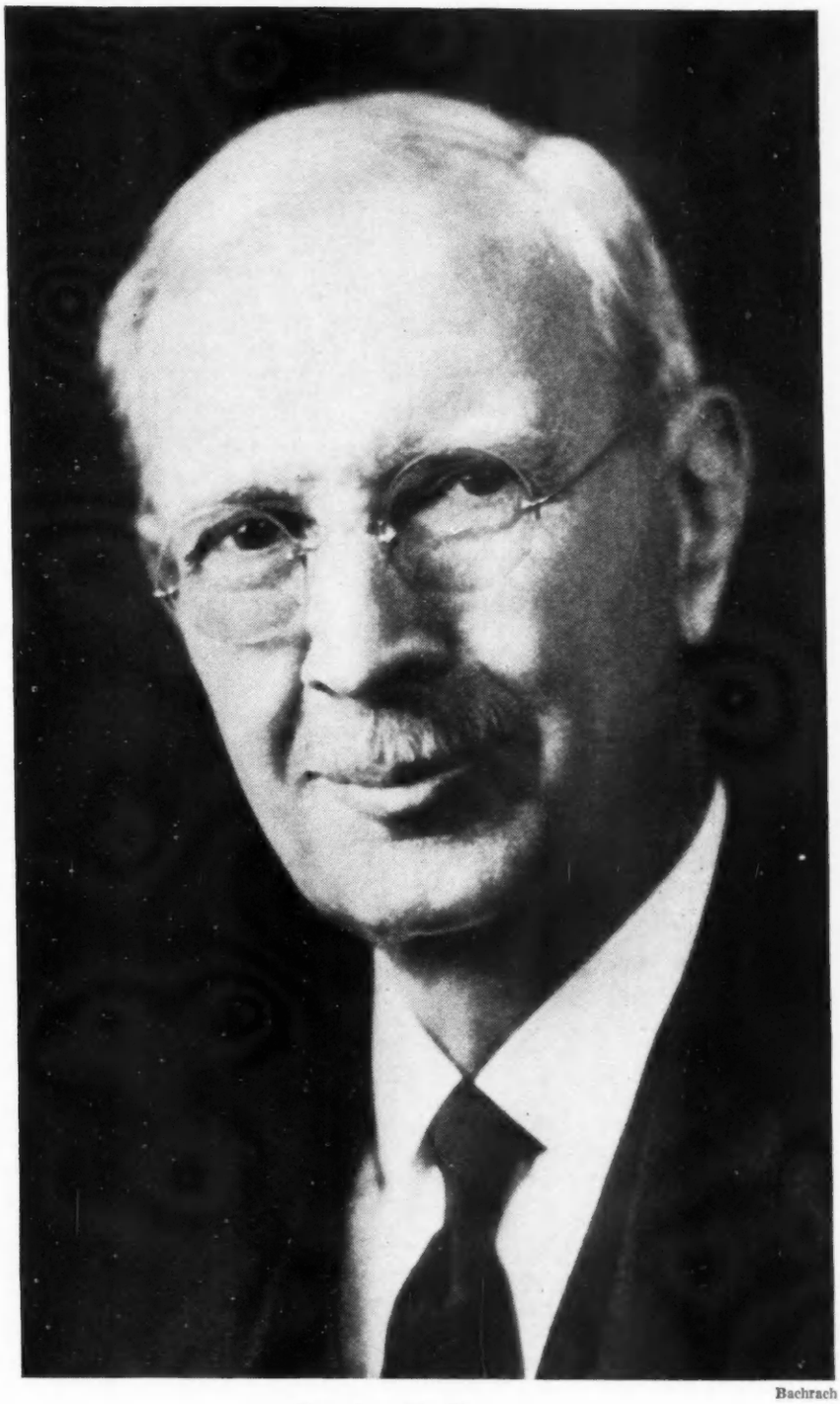
manufactured by the Hartford Rubber Works, of Hartford, Conn., and is believed to have been the first motor vehicle in this country to be fitted with such tires. Victory in the *Times-Herald* contest carried with it a cash prize of $2,000.

Duryea vehicles also won the *Cosmopolitan* (magazine) race between New York and Irvington-on-Hudson in 1896, and they are said to have outdistanced all competitors in a test run from London to Brighton (England) in the fall of 1896.

Charles E. Duryea was the first president of the American Motor League, an organization of motor enthusiasts, formed in Chicago in 1895.

While the Duryea vehicles shone in competition, manufacturing operations at the Springfield plant did not progress very satisfactorily. In 1898 J. Frank Duryea left the Duryea Motor Wagon Company, and the firm seems to have wound up its affairs shortly after. In 1900 Chas. E. Duryea organized the Duryea Power Company, of Reading, Pa., to manufacture an improved automobile of a light type. Up to that time most gasoline vehicles had been provided with reach rods between the front and rear axles, and these were eliminated in the new design. The engine was a three-cylinder type slightly inclined to the horizontal, equipped with a two-speed-and-reverse planetary transmission, from which there was a chain drive to the rear axle. The whole power plant was located under the seat. The Duryea Power Co. made a specialty of three-wheeled vehicles having a single central front steering wheel. A feature of these vehicles was that the control centered in a single lever. Moving this lever transversely steered the vehicle; moving it fore and aft changed gears, and twisting the handle opened or closed the throttle. For one reason or another the car never sold in considerable numbers. It seems that the three-wheeled construction, the one-hand-control, and the rather peculiar body form did not meet with public approval.

The early successes of the Duryea brothers in competitions aroused considerable attention abroad, and arrangements for the production of a Belgian Duryea were made while the Motor Wagon Company in Springfield was still operating. Later Henry Sturmey, a prominent writer on bicycling and automobiling in England, formed a company to manufacture Duryea vehicles in that country. This company continued in operation over a period of years.



Bachrach

Charles E. Duryea

Duryea later moved to Philadelphia, where he spent the rest of his life. For a good many years he conducted the Questions and Answers Department of *Automobile Trade Journal* and had a consulting-engineering and patent-expert business. While in Philadelphia he developed a design of a new very light car featuring a final drive by grooved friction wheels, but this was never put in production.

Mr. Duryea had many interests besides those of motor-vehicle development. One of his hobbies was simplified spelling, and he issued a considerable number of pamphlets printed in his simplified spelling. These were of handy pocket-book size and he always carried a supply with him, which he distributed liberally. Most of these were written to argue his claim to the title of Father of the American automobile. He was interested also in currency reform and advocated the use

(Turn to page 421, please)

BUSINESS IN BRIEF

Written by the Guaranty Trust Co., New York

General business activity was apparently well maintained last week, despite the unsettling effects of the critical situation in Europe and the heavy storm damage in the eastern States. The index of the *Journal of Commerce* for the week ended Sept. 17 stands at 84.2, as against 77.4 for the preceding week, which contained Labor Day, and 103.2 for the corresponding period last year. The effects of the European situation were more apparent in financial markets than in general trade circles.

The index of business activity of the Guaranty Trust Co. for August stands at 72.7, as compared with 68.0 for July and 96.1 for August, 1937. The company's wholesale price index for Sept. 15 stands at 64.3, as against 63.5 a month earlier and 85.8 a year ago.

Railway freight traffic increased sharply during the week ended Sept. 17. Loadings in that period totaled 660,142 cars, showing an increase of 91,255 cars, or 16 per cent, above the figure for the preceding week but a decline of 162,653 cars, or 19.8 per cent, below that for the corresponding period last year.

Electric power output also showed a sharp rise following the holiday week. Production of electricity by the electric light and power industry for the week ended Sept. 17 was 8.1 per cent greater than in the preceding week and only 2.9 per cent below that a year ago. This decline below last year's figure was the smallest reported in many weeks and compares with one of 4.9 per cent a week earlier and one of 7.4 per cent two weeks earlier.

Debits to individual accounts by banks in leading cities for the week ended Sept. 14 were 26 per cent above the total for the preceding week but 18 per cent below that for the corresponding period last year.

Average daily crude oil production for the week ended Sept. 17 amounted to 3,239,050 barrels, showing an increase of 32,150 barrels above the output for the preceding week but remaining below the 3,444,200 barrels calculated by the Department of the Interior to represent the demand for domestic crude oil in September.

Professor Fisher's index of wholesale commodity prices for the week ended Sept. 24 stands at 80.8, as against 80.7 a week earlier and 80.6 both two and three weeks earlier.

Member bank reserves declined $411,000,000 during the week ended Sept. 21, showing the effects of the mid-month Treasury financing and income tax payments. The monetary gold stock rose $167,000,000, Treasury deposits with the Federal Reserve banks $571,000,000, and money in circulation $2,000,000. Excess reserves of member banks on that date were estimated at $2,740,000,000, showing a decrease of $390,000,000 for the week.

Clarke-Harrison Services Engaged by William Sellers & Co.

William Sellers & Co., Inc., Philadelphia, manufacturer since 1848 of machine tools, has engaged Clarke-Harrison, Inc., management engineers, to take charge of all its operations, including research, design, engineering, manufacturing and sales. The modernization program, covering products and plant, which has been under way, will thus be expedited. The first part of this program, involving improvement in planer design and construction, will be announced on or before Nov. 1.

Davis Reports Sufficient Cash To Start Hupp's '39 Program

According to S. L. Davis, president of the Hupp Motor Car Corp., the underwriting group headed by Yantis & Co., Chicago, which has handled Hupp financing in the past, has advanced a sufficient amount of cash, pending completion of permanent financing, to permit the immediate start of production on 1939 models.

Production of Pratt & Whitney Engines Started in France

Having purchased the license for the Twin Wasp Pratt & Whitney aircraft engine, the French Air Ministry recently placed an order with the Talbot-Darracq Co., of Paris, for the construction of 100 of these units. Mr. A. Lago, president of the company, and M. Berger, production engineer, are at present at the American factory in East Hartford, Conn.

This decision of the Air Ministry has aroused discussion in the press and French aviation circles. The attitude of the Ministry appears to be that the present makers of air-

Passenger Car Production by Wholesale Price Classes
(U. S. and Canada)
Eight Months 1938 and 1937 Compared

	Eight Months		Per Cent Change	Per Cent of Total	
	1938	1937		1938	1937
Under $750	1,037,645	2,947,821	− 64.8	87.46	95.89
$751-$1000	130,726	92,685	+ 41.0	11.02	3.02
$1001-$1500	14,367	23,217	− 38.0	1.21	.76
$1501-$2000	2,203	7,898	− 72.1	.19	.26
$2001-$3000	1,208	2,242	− 46.2	.10	.07
$3001 and over	271	130	− 79.2	.02	.....
Total	1,186,420	3,073,993	− 61.4	100.00	100.00

Truck Production by Capacities
(U. S. and Canada)
Eight Months 1938 and 1937 Compared

	Eight Months		Per Cent Change	Per Cent of Total	
	1938	1937		1938	1937
1½ Tons and less	340,891	660,182	− 48.3	92.89	93.66
2 to 3 Tons	13,536	26,782	− 49.4	3.69	3.80
3½ Tons and over	6,140	9,000	− 32.0	1.67	1.28
Special and buses	6,425	8,893	− 27.6	1.75	1.26
Total	366,992	704,857	− 47.9	100.00	100.00

cooled radial engines, Gnome & Rhone and Hispano-Suiza, are not producing in sufficient quantities and are taking advantage of the semi-monopoly they enjoy. Their opponents maintain that if production is not high the fault does not lie with the factory. They also claim that the French engines are technically superior and that the Pratt & Whitney unit has not gone through the French homologation tests and that it is incapable of meeting the requirements with the gasoline and oil used in France.

Talbot-Darracq had never previously undertaken this class of work except for small powered units in the early days of the movement and aviation parts during the war.

Minneapolis-Moline Tractor Styled for Comfort

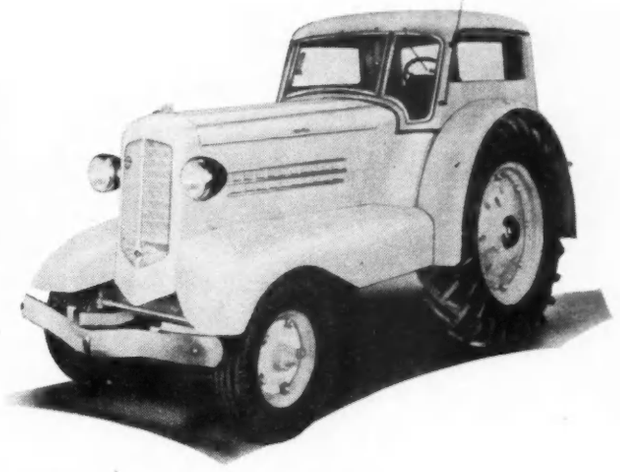
The Minneapolis-Moline Power-Implement Co.'s Comfortractor, referred to in last week's issue of AUTOMOTIVE INDUSTRIES and pictured on this page, is a rubber-tired tractor provided with a closed cab having provisions for heating and ventilation. The cab is of all-steel construction and the windshield is of safety glass. Five gear changes are available, and the tractor is said to have a maximum speed of 40 m. p. h. Gears can be shifted with the tractor in motion, the same as on an automobile.

While the engine is provided with a governor, the governing action is under the control of the driver by means of a pedal. There is complete electrical equipment on the tractor, including electric headlights, an electric starter, windshield wipers, and an electric horn. The dashboard equipment includes a speedometer, an ammeter, an oil-pressure gage, and a water-temperature gage. Other items of equipment include a radio, a cigar lighter, and an ash tray.

The M-M Special DeLuxe tractor is equipped with a four-cylinder vertical valve-in-head engine of 4¼-in. bore by 5-in. stroke (283.7 cu. in.). It has a compression ratio of 5.6 and is governed at 1275 r. p. m. The maximum belt horse power on gasoline is 47, and the maximum drawbar horse power, 38. Equipped with 32-12.75 in. tires, the theoretical speeds at governed engine speed are 2.7, 3.5, 4.7, 10.2 and 20 m. p. h., but by speeding the engine up to twice its governed speed the tractor speed can be increased to 40 m. p. h. The tractor has a wheelbase of 80 in., a front-wheel tread of 48½ in., a rear-wheel tread of 59 in., and weighs 6250 lbs.

COMFORT

for the operator is featured in this new tractor by the Minneapolis-Moline Power - Implement Co. A radio, cigar lighter, and an ash tray are among the unusual accessories. The Comfortractor is described on this page.



Automotive Metal Markets

Operating Rates in Many Different Steel Departments Increasing Steadily Under Influence of Heavier Automotive Demand

Demand from automobile manufacturers and parts makers made possible this week not only a somewhat higher rate of operations in flat rolled steel departments, but also in bar mills and cold-finishing activities, which latter for some time had been trailing behind other steel products in the upturn. Especially strip steel buying, for weeks the cause of much complaining on the part of producers, has taken a turn for the better. Quite a few sheet mills are now operating at close to 50 per cent of their capacity. Releases from some automobile manufacturers run relatively high, while those from others, whose assembly belts are still in the preparatory stage, are still light, which condition makes for widely differing reports as to the extent of automotive demand.

The American Iron & Steel Institute reports 46.7 per cent of ingot capacity in operation this week, compared with 47.3 per cent last week. This small dip is ascribed to a correspondingly mild recession in the output in the Chicago district, whereas other steel centers report moderate gains. A strictly theoretical reduction in employed ingot capacity results from the addition by a Detroit district mill of four furnaces to its battery of 12, making 16 in all and giving to the Detroit area a total of 25. This lowers the prevailing rate of employed ingot capacity in the Detroit area to approximately 60 per cent, while with the former equipment it was computable at around 70 per cent.

A $1 per ton advance in the price of pig iron became generally effective on Tuesday, Pittsburgh and Buffalo furnaces falling in line with the price increase, which was initiated in Chicago. The new base price on foundry iron is $21 at Cleveland, Detroit, Chicago, Toledo and Buffalo. Demand from automotive foundries is steadily improving, but so far no round tonnage transactions have been reported.

The European political situation acted as a damper on activity in the tin market. Climbing war risk rates and further upheaval in the sterling exchange rate made importers wary of long range commitments. Automotive consumers, whose takings of tin are only exceeded by those of the tin plate manufacturers, are no more apathetic than the latter who, although they recalled this week that tin during the European War frequently sold at $1 a pound and more, did nothing to provide a reserve in the event of another war. Sellers quoted spot Straits at 43¾ cents at the beginning of the week. One transaction, calling for October delivery, was closed at 43½ cents. On Tuesday the market shot up to 44¼ cents on higher London and Singapore cables.

While the speculative element in London turned its back on copper, causing the export price here to dip sharply, domestic business was well maintained, bookings for the month being estimated at around 60,000 tons. The price of spot electrolytic was unchanged at 10⅜ cents. Waterbury brass and copper mills had difficulty in making shipments owing to the interruption of traffic by floodwaters.

One of the large lead producers has added to the operating schedules of all its plants, the recent price advance having made an increase in output profitable.—W. C. H.

Ourselves and Government

A weekly check list of legislative, executive and judicial actions affecting the automotive industries. First appeared in June 25 issue, p. 831. Corrected to Sept. 29

CONGRESS

Adjourned June 16, sine die. All members of House and 36 Senators retire or face election in Autumn.

Legislative Legacies

MONOPOLY INVESTIGATION. Leon Henderson, secretary of the National Economic (anti-monopoly) Committee reports that no specific date has been fixed for the next meeting of the committee. Exact dates for starting public hearings are also in doubt. Commerce Department members of the committee have mailed out questionnaires to 2300 trade associations.

WAGES & HOURS. Lack of funds will prevent the wage-hour law from getting into full swing until Congress appropriates additional money. The $350,000 available is considered inadequate for more than four or five industry committees which are expected to be functioning by Jan. 1. Calvert Magruder, general counsel, is currently compiling a list of industries which he feels definitely are included under the wage-hour law. The first industry committee named, the textile committee, meets for the first time Oct. 11.

CIVIL AERONAUTICS AUTHORITY. Representatives of trade organizations and an advisory committee of representatives from interested government departments will meet with members of the CAA on Oct. 4 to discuss the proposed plan for surveying the possibilities for a national airport system. This will be the first step taken under the survey, which is provided for by the Civil Aeronautics Act.

The Air Safety Board has announced these appointments: William S. McDuffee, of Fort Worth, former executive of the Bowen air lines and war-time veteran of the air corps, to be executive officer; Louis R. Inwood, former ICC Bureau of Air Mail aide, to be Mr. McDuffee's assistant; Jesse W. Lankford, chief of the Bureau of Air Commerce accident analysis section, and his staff, ordered transferred to the CAA.

Darrell T. Lane, of Salt Lake City, has been named Assistant General Counsel for the Authority.

DEPARTMENT OF JUSTICE

MONOPOLY. Status unchanged since report to AUTOMOTIVE INDUSTRIES issue of Aug. 13.

DEPARTMENT OF LABOR

CONTRACTS. Public Contracts Board reported the following awards for the week ended Sept. 22: United Aircraft Corp., E. Hartford, Conn., with the Navy's Bureau of Supplies and Accounts, propellers, $45,000.25; International Harvester Co., Springfield, Ohio, with the Agriculture Department, trucks, $28,125; General Motors Corp., Chevrolet Division, Detroit, with the Navy Department's Bureau of Supplies and Accounts, trucks, $32,476.71; Eclipse Aviation Division of Bendix Aviation Corp., E. Orange, N. J., with the Ordnance Division, War Department, transmission systems, $211,710; Sperry Gyroscope Co., Inc., Brooklyn, N. Y., with the Air Corps, War Department, indicator assemblies, $376,600; Walter Kidde & Co., Inc., New York and Bloomfield, N. J., with the Air Corps, War Department, oxygen cylinder assemblies, $125,984.

STEEL LABOR. Recommendations for fixing minimum wage rates for firms doing government business may be made late next week by the Public Contracts Board.

AIRCRAFT LABOR. Deadline for filing briefs in protest to the Board's recommendations of a minimum wage of 60 cents for most employes, 40 cents for learners, is Sept. 30.

NATIONAL LABOR RELATIONS BOARD

NLRB has approved a stipulation entered into with the Pittsburgh Plate Glass Co., of Crystal City, Mo., in which the company, in response to a Labor Board order, agreed to discontinue discouraging membership in the CIO flat glass workers union; to withdraw recognition from the Crystal City Glass Workers' Union, which the Board described as "an inside organization"; to stop circulation of articles in a house organ allegedly aimed at discrediting labor union principles; and to refrain from purported surveillance over labor organizational activities.

FEDERAL TRADE COMMISSION

INVESTIGATION under the Withrow-Minton Resolution (M. J. Res. 351), Status remains unchanged since report in AUTOMOTIVE INDUSTRIES issue of Aug. 13.

F.O.B. PRICES case vs. G.M. and Ford, in which the FTC alleged that price advertising was misleading because of failure to include standard equipment, expected to be called up for hearing soon.

SIX PER CENT CASE. FTC cited Ford and General Motors in July, 1937, complaining of false and misleading representations in advertising prices of automobiles. Complaint alleges advertising six per cent charge on deferred payments by retail purchasers is misrepresentation because no provision is made for amortization. Case has been in the hands of the trial examiner for several weeks. The FTC brief is expected to be ready soon.

FAIR TRADE PRACTICE rules for retail automobile dealers, introduced at public hearings during last NADA meeting in Detroit (see A.I., April 30, 1938), are still under study by the FTC fair trade practice division headed by George McCorkle.

40 Years Ago

with the ancestors of AUTOMOTIVE INDUSTRIES

Electric Cab Station

The most complete plant in the world for the care and maintenance of electric vehicles is just being completed by the Electric Vehicle Co., at 1684 Broadway, New York. The chief feature of this plant is the remarkable facilities for charging, loading and unloading the storage batteries from the cabs.

—From *The Horseless Age*, September, 1898.

New Passenger Car Registrations

	AUGUST 1938	JULY 1938	AUGUST 1937	EIGHT MONTHS 1938	EIGHT MONTHS 1937	Per Cent Change, 8 Months, 1938 over 1937	Per Cent of Total Eight Months 1938	Per Cent of Total Eight Months 1937	TEN MONTHS MODEL YEAR 1938	TEN MONTHS MODEL YEAR 1937	Per Cent Change
Chevrolet	35,684	37,706	71,211	313,105	558,569	− 44.0	25.03	20.93	408,408	687,630	− 40.6
Ford	27,079	30,499	54,751	262,408	632,285	− 58.5	20.98	23.69	302,144	706,903	− 57.2
Plymouth	14,675	22,480	43,730	173,957	356,939	− 51.3	13.91	13.37	218,469	437,971	− 50.1
Buick	10,173	12,807	18,344	103,336	143,699	− 28.0	8.26	5.38	134,340	178,319	− 24.7
Dodge	6,735	8,162	24,019	69,689	195,685	− 64.4	5.57	7.33	93,297	232,888	− 60.0
Pontiac	5,749	7,001	20,916	63,466	160,748	− 60.5	5.07	6.02	84,359	188,792	− 55.3
Oldsmobile	5,856	6,784	17,563	60,442	145,609	− 58.5	4.83	5.46	78,623	166,178	− 52.6
Packard	3,455	3,782	7,649	32,810	74,267	− 55.8	2.62	2.78	42,871	87,363	− 51.0
Chrysler	2,997	3,728	8,408	32,042	65,286	− 51.0	2.56	2.45	43,605	76,323	− 42.8
Hudson	2,854	2,962	8,330	26,963	70,971	− 62.0	2.16	2.66	35,407	86,190	− 58.9
De Soto	2,594	2,717	7,435	24,286	54,778	− 55.6	1.94	2.05	32,851	62,898	− 47.8
Studebaker	3,177	3,045	5,378	23,548	53,017	− 55.6	1.88	1.99	30,531	63,746	− 52.1
Nash	2,528	2,612	6,465	22,613	55,574	− 59.2	1.81	2.08	27,790	58,582	− 52.5
Lincoln	1,170	1,291	2,206	11,940	18,676	− 36.0	.95	.70	15,160	22,067	− 31.1
La Salle	981	1,083	2,742	9,335	21,473	− 56.5	.75	.80	12,603	25,673	− 50.9
Willys	1,119	982	5,242	9,053	40,182	− 72.5	.72	1.50	13,270	41,390	− 68.0
Cadillac	619	770	998	7,074	8,704	− 18.6	.57	.33	8,213	10,922	− 24.9
Graham	258	273	1,315	3,000	10,418	− 71.2	.24	.39	4,275	12,696	− 66.4
Hupmobile	111	114	23	816	23		.07		1,030	45	
Pierce-Arrow		2	1	16	148			.01	30	242	
Miscellaneous	141	100	232	1,001	2,030	− 50.7	.08	.08	1,301	3,868	− 66.4
Total	127,955	148,900	306,958	1,250,900	2,669,081	− 53.1	100.00	100.00	1,588,577	3,150,686	− 49.6
Chrysler Corp.	27,001	37,087	83,592	299,974	672,688	− 55.4	23.98	25.20	388,222	810,080	− 52.1
Ford and Lincoln	28,249	31,790	56,957	274,348	650,961	− 57.9	21.93	24.39	317,304	728,970	− 56.4
General Motors	59,062	66,151	131,774	556,758	1,038,802	− 46.3	44.51	38.92	726,546	1,257,514	− 42.2
All Others	13,643	13,872	34,635	119,820	306,630	− 61.0	9.58	11.49	156,505	354,122	− 55.8

Just Among Ourselves

Better Highways for Better Markets

INCISIVELY, pungently, Dr. Miller McClintock summarized the basis of the automobile industry's future marketing problem as guest speaker at the Studebaker preview. Said the always stimulating director of the Bureau for Street Traffic Research: "The motor vehicle market of 1940 will be determined by physics, not economics."

He made it apparent that the physics he meant was connected with the velocity of traffic flow, and the friction which arises out of traffic impedence. Average traffic in the United States moves at 17.5 m.p.h., according to Dr. McClintock. Americans move about 500 billion miles a year by motor vehicle, but the figure should probably be increased 10 per cent for complete fulfillment of the social utility of motor vehicles. But it can't be increased without bringing down the average rate of flow—which is already slow enough to be an economic burden. What's the answer?

Stop the diversion of motor-vehicle tax funds, says Dr. McClintock. Build highway facilities which match our present traffic needs. The money is available now from normal sources.

Good Times Ahead for Accessory Plants

TWO facts should make the accessories section at the National Automobile Show a focal point of public and trade interest this year. The fundamental fact is that most automobiles this year will be carefully scaled to the lowest possible price level. Inevitably this will mean that in spite of strong efforts to have "complete cars" for competitive reasons, there will not be much effort to decorate cars with a lot of accessories at the delivered-in-Detroit price. Some car factories have already stated frankly that dealers will be allowed more opportunity to make a profit from accessories in 1939. There will be less emphasis on factory installations; more opportunity for the dealer to reap the installation profit as well as the sales profit.

The dealer will have wider latitude, naturally, in his choice of lines of accessories to be installed. There will continue to be "factory-approved" lines of accessories, but longer discounts on them will in many cases replace other forms of sales stimulus which have been apparent in the past.

A large portion of the public which attends the New York show goes first by elevator to the top floor of the Grand Central Palace, and gravitates to the lower floors at a speed which depends on the interest of the upper exhibits. Accessory manufacturers have a real opportunity to hold public interest by using adequate space and dramatic displays at the New York show, instead of assuming that an exhibit is a necessary evil, and planning the exhibit accordingly.

Which makes, in all, three sound reasons why the accessory manufacturer should give special thought to the possibilities of exhibiting at this year's National Automobile Show, which opens in New York on Nov. 11.

Showroom Splendor Bows to Expediency

THE big, glamorous automobile showroom, situated as a matter of course on "automobile row," in the high rent district of Anytown—is a thing of the past, according to one sales executive we talked with on a recent previewing trip. Dealers, particularly single-line dealers can't stand the overhead of such a set-up, he believes, and the trend will be toward more accessible sales and service establishments in parts of the big cities where the rent is lower and prospects can find a parking place.

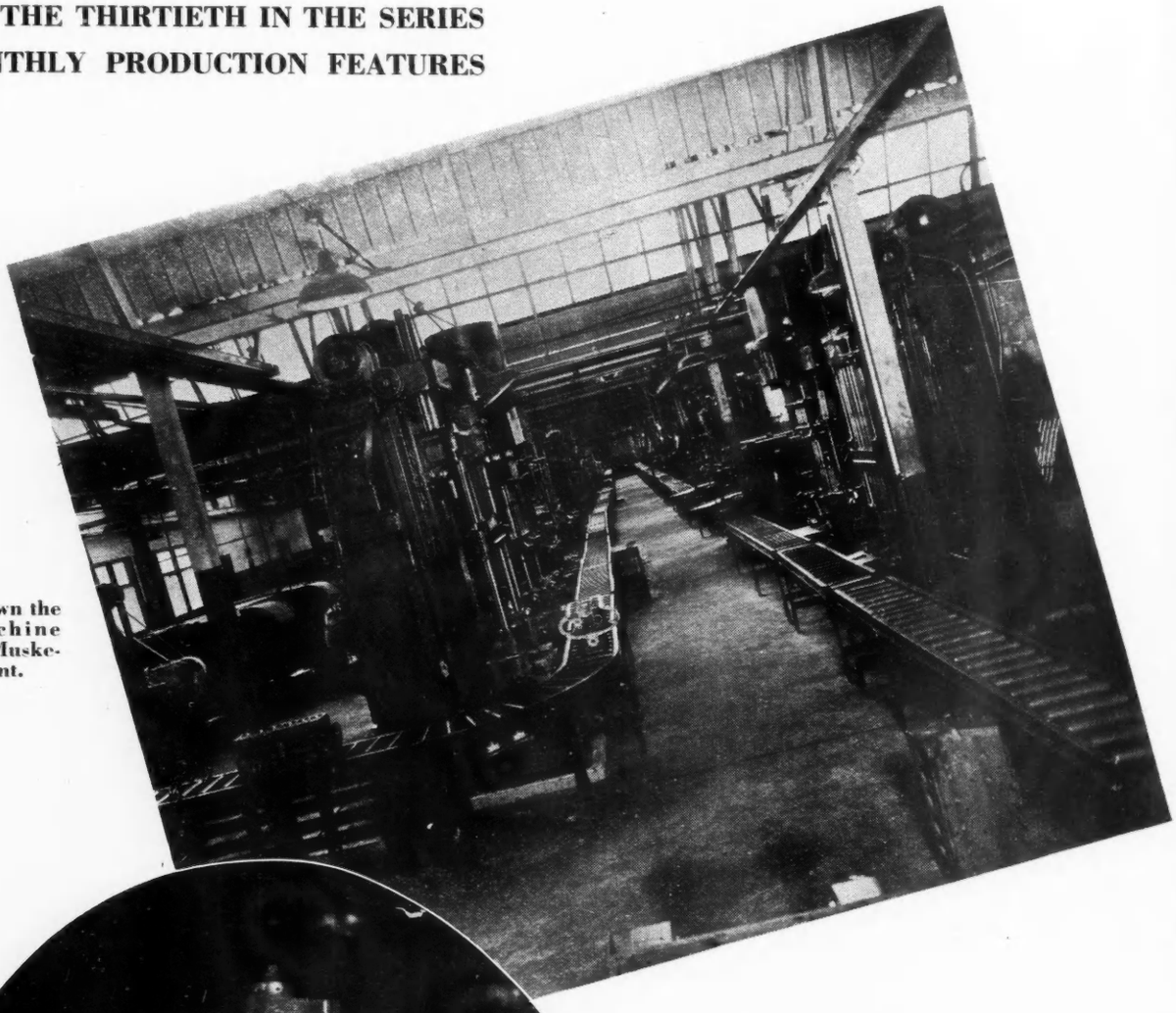
In the dealer establishment of the future, he believes, the emphasis will be on service, and the keynote of the problem of getting customers in for servicing regularly, is accessibility of the premises.

There was a strong hint in the conversation—it kept cropping up, just as it did at the last NADA convention—that multiple-line dealerships may come back into the sales picture in a larger way.

Multiple-line dealerships are used now, of course, by several manufacturers who double up their own lines in the same dealerships. There are several hundred dealers in the country, particularly in isolated districts, who handle competing lines from the same or different manufacturers. But, according to our interlocutor, a good many of such existing outlets are created under artificial conditions. The point of a multiple-line dealership is to let the dealer make more money and to get broader distribution in territories where a single-line set-up wouldn't attract worthwhile dealers. To effect profitable arrangements with these factors in mind, requires careful study of local conditions and market potential.

——HERBERT HOSKING

THIS IS THE THIRTIETH IN THE SERIES OF MONTHLY PRODUCTION FEATURES

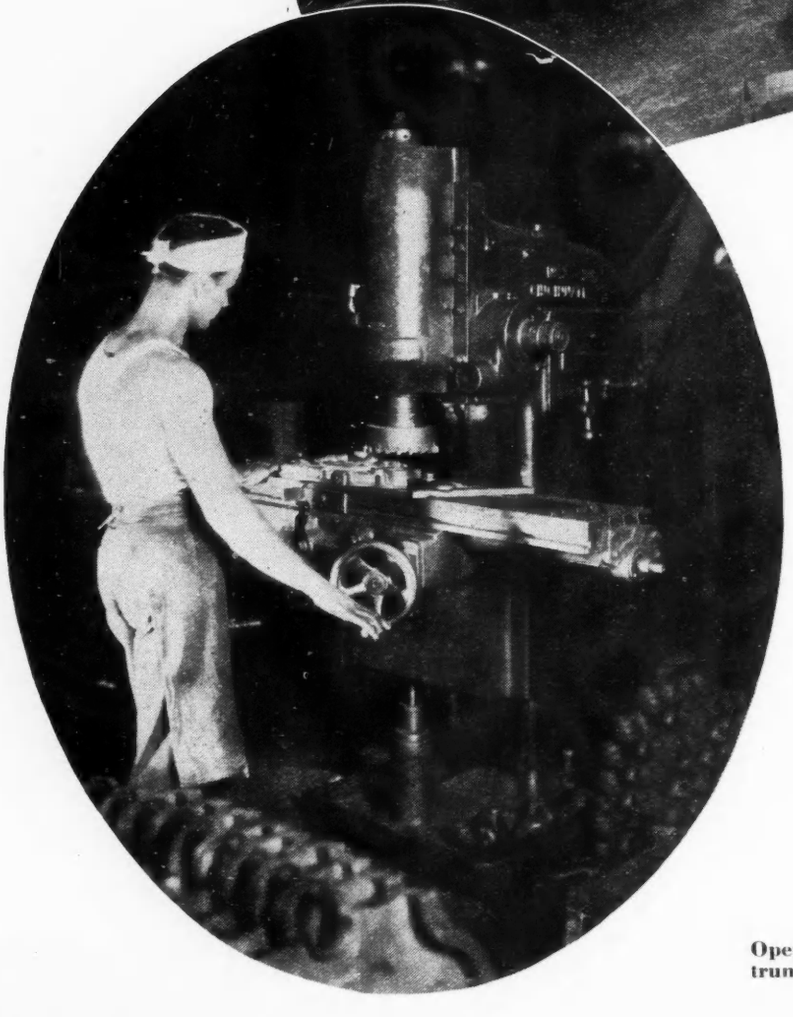


Looking down the Diesel machine line at the Muskegon plant.

By JOSEPH GESCHELIN

DISTINGUISHED as a builder of heavy-duty engines, exclusively, since 1915, Hercules Motors Corp., Canton, Ohio, has spread the gospel of efficient and dependable internal-combustion engine power over Europe, to the far reaches of the Orient, in the United States, and in the Americas. Hercules engines are known wherever motor trucks, buses, and mobile industrial power plants are used; they are specified by more than a score of outstanding makers of buses and trucks, including four manufacturers of passenger cars whose overseas commercial vehicles are equipped with Hercules Diesel power.

The current line comprises 49 different models ranging in capacity from 4 hp. to 200 hp. actual dynamometer rating in two-cylinder, four-cylinder, and six-cylinder



Operation in Canton gear cover department—milling trunnion face of JX-QX gear covers on a Cincinnati No. 3 vertical milling machine.

49 Diesels,-

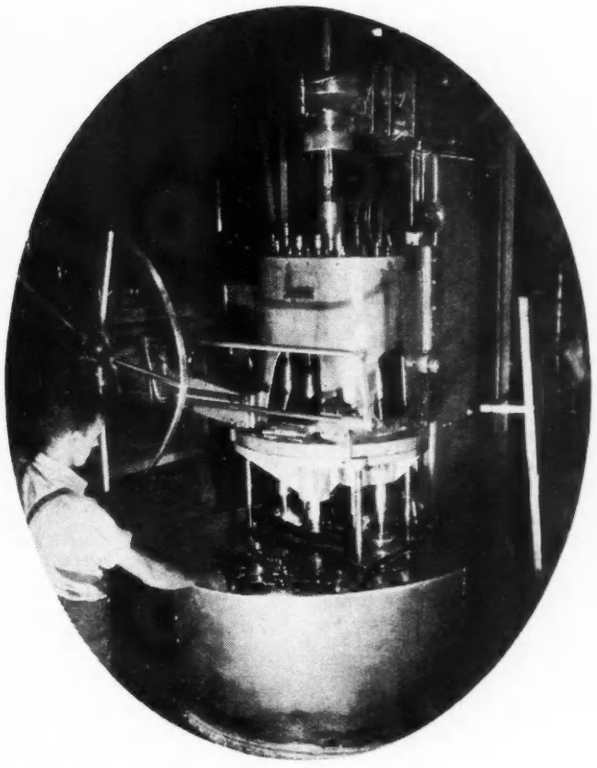
ranging from 4 to 200 hp., travel the Hercules production line with equal facility.

types, including three four-cylinder and six six-cylinder Diesels. Paralleling the basic engine models is a wide variety of stationary and portable power units.

While not a matter of wide public knowledge, Hercules four- and six-cylinder Diesel engines have been used as standard equipment for the export trade by the greatest names in the motor car industry—passenger car builders who make light commercial vehicles and motor trucks for overseas duty.

From the modest beginning in 1915 when the company was housed in a small two-story brick building, employing but 200 people, Charles Balough has been the president guiding its fortunes to its present niche in the industry. Building a product of character and quality at the lowest possible unit cost, he points with pride to the $10 million net annual sales of recent years. Policy today is great expansion of dependable high-speed automotive Diesel power, realizing that only through wide distribution and increasing volume will it be feasible to lower the ceiling of high grade Diesel power cost.

Hercules manufacturing and executive activities center at Canton, Ohio, in a plant which has been expanded to a productive floor space of some 238,461 sq. ft. in area, which employs 2300 people at its peak activity. Not widely known is the very modern machine shop at Muskegon, Mich., with productive floor space of 35,665 sq. ft., equipped to machine Diesel or gasoline engine cylinder blocks and heads during periods of activity when the Canton final assembly lines are stressed to capacity. Matt Kuepfer is general superintendent of the Canton and Muskegon plants; H. P. Johnson is superintendent at Muskegon; F. J. Malone is plant and planning engineer for both plants.

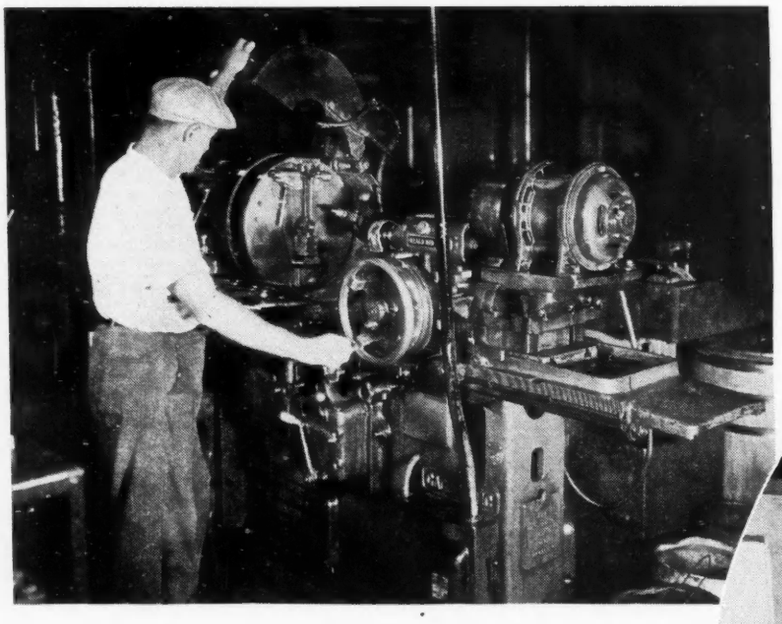


Natco multiple spindle set-up at Canton for drilling and fly-cutting wrist pin holes on JX-QX connecting rods.

In addition to these domestic facilities, the expansion of overseas business has encouraged the establishment of a British licensee—Ruston and Hornsby, Ltd., of Lincoln, England, operating a modern engine building plant which is now turning out Hercules engines under the license agreement.

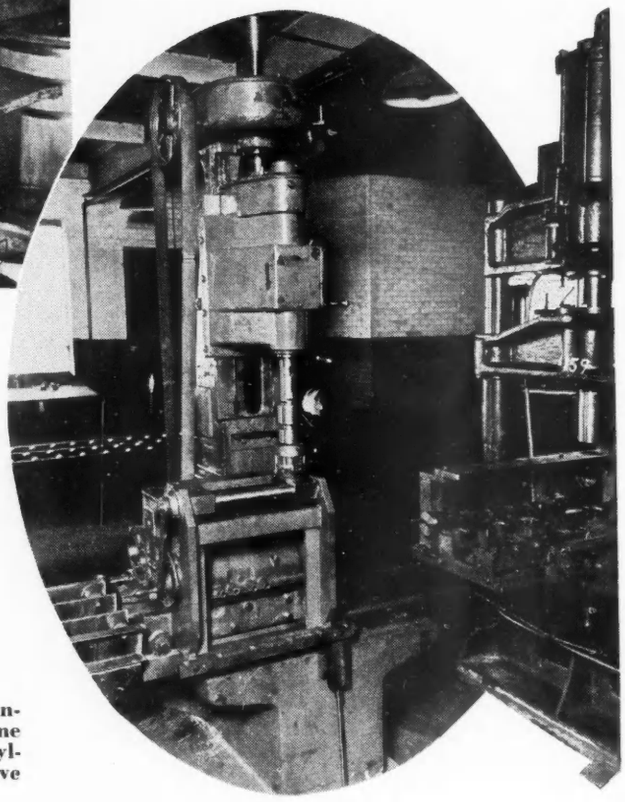
Quality is the priceless ingredient of the whole operation. The Canton plant boasts one of the largest final test departments in the industry, offering in evidence a great department fitted with 47 G.E. electric dynamometers. Every engine that leaves the assembly lines must run the gauntlet of an exacting test with full dynamometer schedule. Every engine in the field leaves its record in the files at Canton, certifying the power curve, listing part numbers of major elements, recording piston clearance and compression pressure for each cylinder, recording flywheel alignment.

Multiplicity of basic engine models combined with all the possible variety of special options required by its many customers, places great stress on production management



layout, materials handling; flexibility with respect to the variety of jigs and fixtures which control the operations of general purpose machinery.

That these requirements have been ably met is obvious when one follows the description of the plant



and materials scheduling. For example, there are over 600 different bell housings for the 49 basic engines. Production men will sense that production economy in this operation is best served by the development of compact production departments equipped with general purpose machinery for the majority of operations. With multiple-lot production, as is the problem here, flexibility plays a vital rule—flexibility with respect to equipment,

(Above) Heald Gagematic grinder is used for finish-grinding wrist pin holes in Canton connecting rod department.

Heavy duty single spindle Foote-Burt machine is used for reaming cylinder bores to receive the liners.

Hercules Factory Routing (Muskegon)

Diesel Cylinder Head Model DOO

OPERATION	EQUIPMENT
Snag	
Paint	
Mill face to block and mill manifold pad	Ingersoll fixed rail milling machine
Mill top of head and mill air intake pad	Ingersoll fixed rail milling machine
Drill 21 holes in face to block	Baush 34-spindle multiple drill
Drill 27 holes in face to block	Baush multiple spindle drilling machine
Drill 14 holes in top	Baush multiple spindle drilling machine
4—17/32 in.—12 deg. angular glow plug holes	Baush multiple spindle drilling machine
8—23/64 in. manifold holes	Baush multiple spindle drilling machine
Spotface spring seats, 17 holes	24 in. single spindle Aurora drill
Finish machine 8 valve holes, 48 holes (total)	24 in. single spindle Cincinnati drill
Drill 21 miscellaneous holes	American radial drill
Machine 4 glow plug holes, 32 operations (total)	24 in. Niles-Bement-Pond single spindle drill
6 pipe tap holes	24 in. Cincinnati single spindle drill
Countersink and tap 22 holes	Hammond tapper
Surface grind face to block	Pratt & Whitney surface grinder
Water test	Hercules design
Rough and finish bore combustion cups (4)	No. 310 Baker drill
Press in valve guides (8) 2 at a time	Hannifin air press

layout and the routing of major parts. It is of interest to note at this point that in the organization of manufacturing departments, each of the major parts—cylinder blocks and cylinder heads—too intricate for general purpose machine routing is handled in separate, self-contained departments in which the parts are routed machine to machine. In general, the smaller detail parts are handled in a departmentalized set-up wherein each burden center accommodates the family of similar parts, regardless of size, for every engine in current production.

At Muskegon where parts for only a few models are handled, the equipment and layout are also of the most modern character and the unit-type machine lines have sufficient flexibility to handle four different models over the same high production line.

Although multiple-lot production leaves but slight opportunity to take advantage of the latest wrinkles in cutting tool developments, numerous operations are tooled with cemented-carbides; practically all milling, turning, and boring operations utilize Stellite J-Metal, with Haynes Stellite-2400 metal accounting for the particularly tough jobs.

By its very nature, this operation requires flexibility in the handling of materials. While the layout does not permit the use of power-driven monorail conveyors, an efficient flow of materials is assured by the use of gravity roller conveyors for machine to machine movement, by the use of overhead hoists and cranes for heavy lifting, by the use of industrial trucks, both hand and power-operated, for transporting raw and finished product.

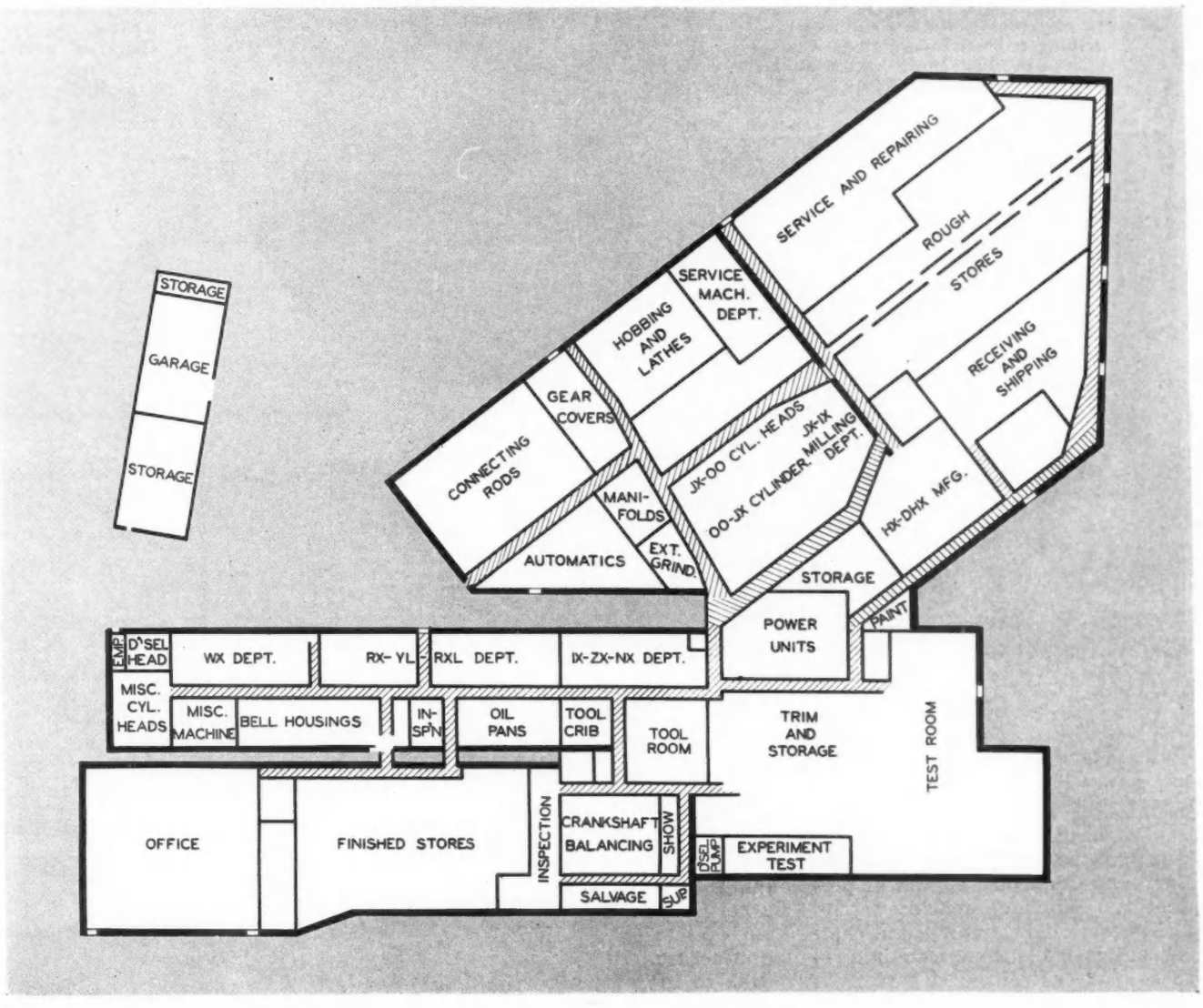
Finally it may be noted that multiple-lot production of this nature demands machine operators of more than usual ability. They are not machine tenders in any sense since the flow of work is constantly shifting from one type of part to another—with different fixtures, different sizes and locations of holes and bores and other details. At Hercules the machine operators acquire constantly improved facility and skill in the handling of machines and operations.

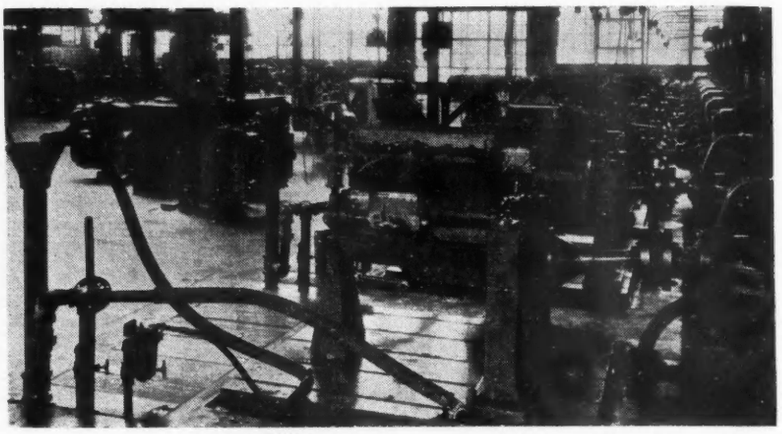
First Floor Plan—Canton Plant

The unique floor plan at Canton may best be appreciated by examining the layout shown below. The first floor comprehends all the gamut of activity—receiving, shipping, machine shops, testing, storage, etc., all except engine assembly which takes place on the second floor, as will be described later.

Observe how well the plant lay-

Layout of manufacturing departments in Canton plant of Hercules Motors

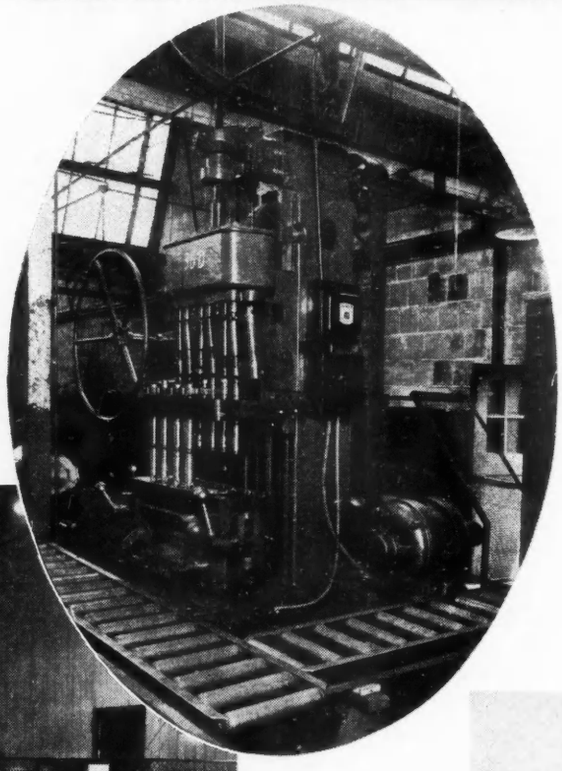




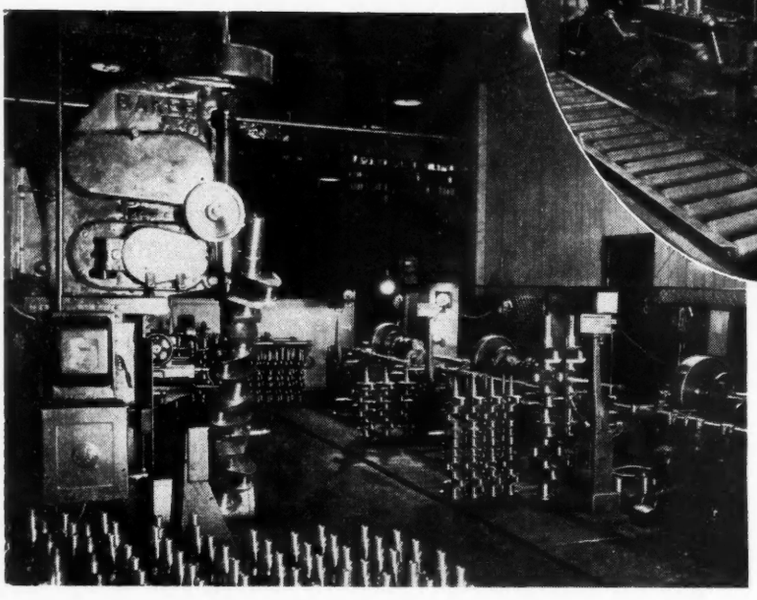
A perspective of one of the rows of dynamometers in the final test department in Canton. It gives only a slight impression of the imposing unit of 47 dynamometer stations.

out takes advantage of the peculiar disposition of productive floor space. All incoming materials, whether raw or finished product, enter through the receiving department at the upper right, either by truck or rail, are stored and ready for distribution in the area immediately above. From this point the parts are delivered to the machine shop departments.

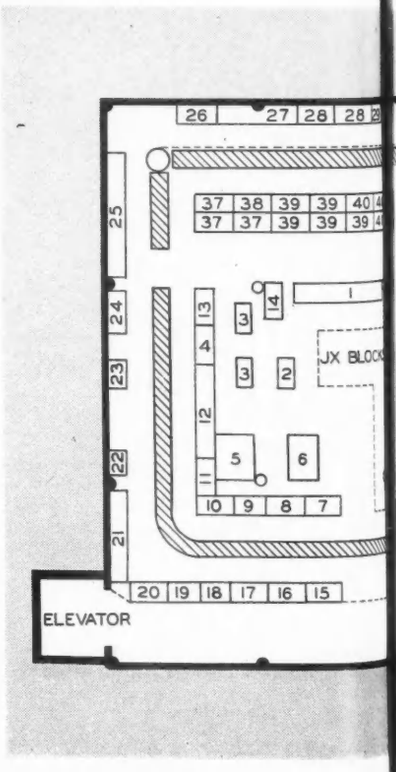
The layout encompasses a variety of activity. First there are several self-contained machine lines, one for each of the cylinder blocks; then there are three different ma-



Multiple - spindle Natco drill is used for rough boring of combustion chambers in Diesel cylinder blocks at Muskegon.



Corner in the Canton crankshaft final inspection department. At the left, in the foreground, is the massive heavy-duty Baker drill used for drilling balance holes; at the right, part of the battery of Gisholt crank balancing machines.



chine lines for cylinder heads. Bell housings, connecting rods, gear covers, oil pans, manifolds—each has a separate and self-contained department through which flow similar parts for every engine in production. Hobbing machines and lathes, external grinding, automatics, and miscellaneous machining—these are centralized departments for handling special operations on all manner of parts.

The section marked "hobbing" is the centralized gear department making gears for every engine in the line. This department is equipped with a battery of over 20 Barber-Colman hobbing machines, used exclusively in Hercules gear manufacture.

Due to the nature of the operations, as described above, it would

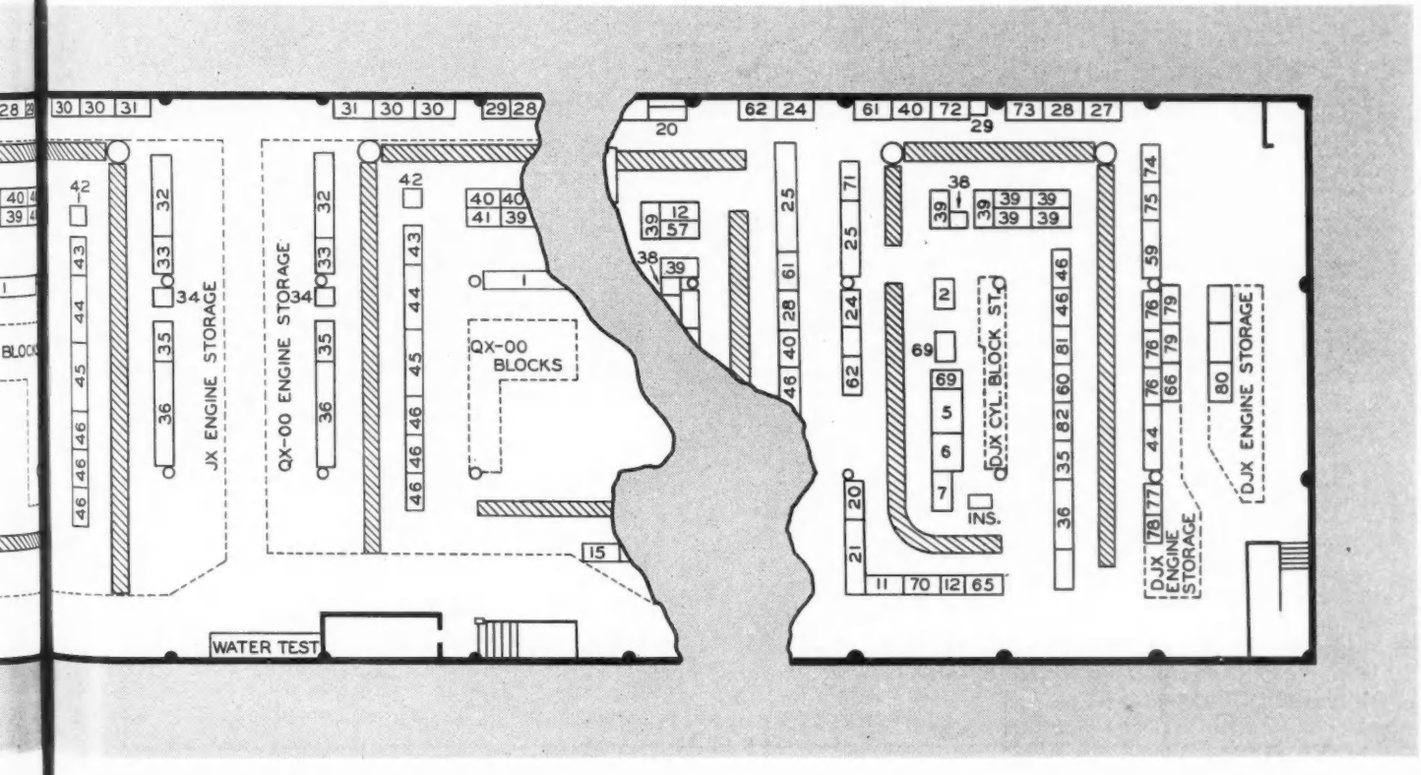
be quite difficult to give a word picture of the activity along any of the machine lines. To provide a reasonable perspective we have reproduced a number of typical factory routings which show clearly and completely not only the sequence of operations but the kind of equipment employed for this purpose. Routings cover the following parts—Connecting Rod and Cap (Canton Plant), Gear Cover (Canton Plant), Diesel Cylinder Head (Muskegon Plant), Cylinder Block (Muskegon Plant).

Cylinder block and head machining procedure at Muskegon has been selected chiefly because it pictures the most recent mechanization program, featuring machines and layout of the most advanced type consistent with the volume of production. It may be noted, however, the sequence of operations on

Hercules Assembly Lines

Upper floor is devoted entirely to engine assembly lines. The sketch below is a condensed plan of the end departments, the one at the extreme left being devoted to the high production JX engine assembly

No.	Operation	No.	Operation	No.	Operation
1	Fit pistons	30	Assemble idler gears	61	Fuel pump drive shafts and sleeves
2	Burr	31	Arbor press		
3	Countersink valve seats and ream guides	32	Oil pan details	62	Burr main bearing caps and thrust flanges
4	Lap valves	33	Assemble oil pans	63	Assemble rocker arms and dust covers
5	Wash block	34	Desk	64	Purolators and oil filler pipes
6	Clean block with air	35	Assemble oil pans	65	Tappet sleeves and valve covers
7	Cut oil grooves in main bearing caps	36	Oil pan storage	66	Grind valves
8	Assemble valve tappets	37	Assemble pistons to rods	67	Valve tools and storage for head parts
9	Rack for cam shafts	38	Wash piston assembly	68	Assemble cylinder head
10	Lathe	39	Connecting rod assembly	69	Set studs
11	Arbor press	40	Water pump assembly	70	Inspect camshafts
12	Camshaft storage	41	Clean burr cylinder heads and manifolds	71	Idler shafts and sprocket gears
13	Valve storage	42	Desk	72	Sprocket chains and oil throw
14	Valve tools	43	Wash cylinder heads and manifolds	73	Oil purolators
15	Main bearing inspection bars	44	Manifold storage	74	Combustion chambers
16	Crankshaft storage "finished"	45	Cylinder head storage	75	Fit combination chambers (in head)
17	Crankshaft inspection	46	Assemble gear covers	76	Rocker arms and push rods
18	Press in flywheel bolts	50	Manifold and cylinder head gaskets	77	Dust cover gaskets
19	Flywheel bolts	51	Cylinder head and manifold bolts	78	Dust cover storage
20	Crankshaft wash	52	Oil pan dope	79	Assemble cylinder head
21	Crankshaft and storage "rough"	53	Wash copper tubing	80	Valve storage
22	Desk	54	Water pump sprocket gears	81	Gear thrust plates
23	AC-180 cycle generator	55	Copper oil pipes	82	Fuel injector pump bracket
24	Bell housing gaskets	56	Oil strainers	83	Piston storage
25	Bell housing storage	57	Idler shafts	84	Pistons
26	Crankshaft oil throws	58	Valve tappet clusters	85	Gear storage
27	Oil pump details	59	Cylinder head gaskets	86	Gear heater
28	Assemble oil pumps	60	Valve covers and oil filler pipes		
29	Miscellaneous wash				



the similar machine lines at Canton are alike in most respects, differing only in the character of the machines. This is quite logical since the Canton machine shops utilize general purpose machines, in the main, to facilitate flexibility while the Muskegon plant was laid out to handle four types of blocks over the same line.

Referring to the sequence of operations on the cylinder block line at Muskegon, it is of interest to note a few of the high-spots which reflect its modernity. First operation is the milling of top and bottom surfaces on an Ingersoll fixed rail type milling machine. Skipping intermediate operations, we come to the Baush multiple spindle drilling machine which takes 32 holes in the bottom and 27 holes in the top. A similar Baush machine takes the 30 drilled holes in the top and valve side.

Angular oil leads are drilled on a Natco multiple spindle driller. Hammond tapping machines are used for tapping the various holes, while miscellaneous drilled holes are taken care of by a battery of radial drills which handle operations of this kind so efficiently.

Rough boring, finish boring, and reaming of cylinder bores are handled on Putman and Moline Hole-Hogs, while a single spindle Barnes honing machine fitted with a Micromatic hone takes care of the honing operation.

Baker drill presses are employed for rough boring of the combustion

Hercules Factory Routing (Muskegon)

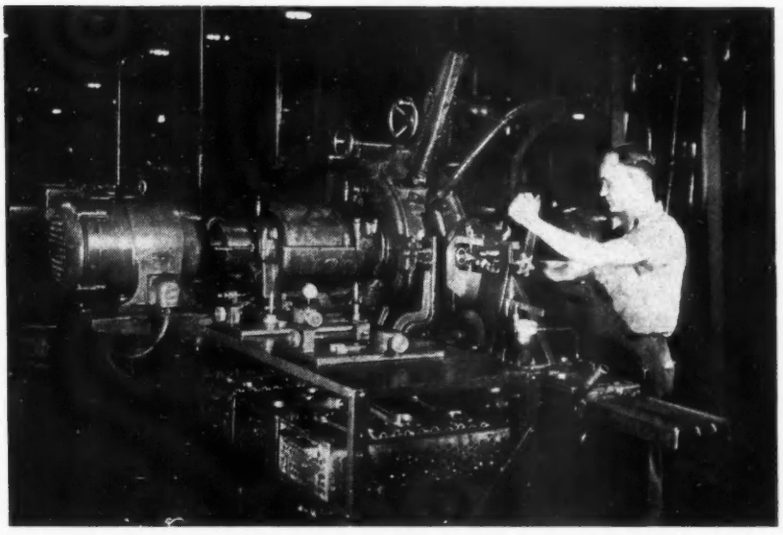
Cylinder Block Model DOO and DJX

OPERATION	EQUIPMENT
Mill top and bottom	Ingersoll fixed rail milling machine
Drill and ream process holes	Cincinnati 21 in. special drill (4 spindle)
Mill ends	Ingersoll fixed rail milling machine
Rough bore cylinders	Moline Hole Hog equipped with Hercules Design-precision-roller bearing fixed spindle head
Mill valve side	No. 4 LeBlond horizontal mill with special 3 spindle head
Mill water side	No. 4 LeBlond horizontal mill with special 4 spindle head
Mill ledge pad	No. 2 Cincinnati vertical mill
Rough bore combustion cups	No. 41 Natco drill
Drill long oil hole	W. F. & John Barnes 2-way drilling machine
Rough bore crank line	Rockford horizontal boring machine
Straddle mill main bearings	Ingersoll rise and fall miller
Bore and face oil pump hole No. B-61	No. 310 Baker drill
Drill 32 holes in bottom	Baush multiple driller
Drill 27 holes in top	Baush multiple driller
Drill 10 miscellaneous holes in bottom	Radial drill—Cinn.-Bickford
Core drill cam hole	W. F. & John Barnes 2-way driller
Semi-finish and finish bore cam hole	Rockford horizontal boring machine
Hand ream cam line	Rockford horizontal boring machine
Drill 14 valve tappet holes and 6 holes in rear end	No. 4 Baush multiple spindle drill
Bore water pump sleeve hole	No. 2 Rockford horizontal boring machine
Bore fuel pump sleeve hole	No. 2 Rockford horizontal boring machine
Mill water pump pad	No. 4 Cincinnati horizontal milling machine
Drill 17 holes in front end	Natco multiple drill
Drill 15 miscellaneous holes in sides and end	Radial drill, Cincinnati-Bickford
Drill 3 angular oil leads	Natco multiple drill
Drill 7 miscellaneous angle holes	Radial drill, Cincinnati-Bickford
Drill 4 angular holes	4 drill units
Counterbore 14 main bearing bolt holes	Hammond tapper
Bore, ream and spotface 24 valve tappet holes	Cincinnati single spindle drill
Semi-finish bore crankline	No. 2 Rockford horizontal boring machine
Bore idler hole	Rockford horizontal boring machine
Drill 3 angular holes in cam line	Electric drill
Press in cam bushings	Oilgear horizontal hydraulic press
Press in 8 valve tappets and broach	American vertical hydraulic broach
Finish bore and ream cylinders	Moline Hole Hog (4 sp.) equipped with duplicate head same as on roughing operation
Tap both ends, 31 holes	Hammond tapper
Tap top and bottom, 49 holes, and chamfer	Hammond tapper
Wash	Niagara washer
Assemble Welch plugs	Bench
Assemble bearing caps	Conveyor
Ream 42 holes and assemble bearing cap dowels	American radial drill
Finish bore crankline	W. F. & John Barnes 1-way boring machine
Face both sides of thrust bearing	Single spindle drill (Baker No. 217)
Bore bell housing pilot (long line)	No. 2 Rockford horizontal boring machine
Drill top and valve side, 30 holes	Baush multiple drill
Drill 23 remaining holes in top	Radial drill, Cincinnati-Bickford
Drill 34 remaining holes in sides	Radial drill, Cincinnati-Bickford
Chamfer and tap 53 remaining holes	Hammond tapper
Bore combustion passage (4 holes)	No. 310 Baker drill
Assemble expansion plugs	Bench
Surface grind top of block	14 in. Pratt & Whitney vertical grinder
Finish combustion cups (4 holes)	No. 310 Baker drill
Drill and bore 4 nozzle holes	Radial drill, Cincinnati-Bickford
Drill ⅛ angular holes in combustion cups	Electric drill
Saw slot	No. 310 single spindle Baker drill with Hercules special design head
Water test	
Counterbore for cylinder sleeves	Aurora drill press
Ream for cylinder sleeves	1-spindle Foote-Burt cylinder reaming machine with McCrosky reamers
Press in cylinder sleeves	25-ton Oilgear hydraulic press
Hone cylinders	Single spindle Barnes honer
Inspect	Conveyor

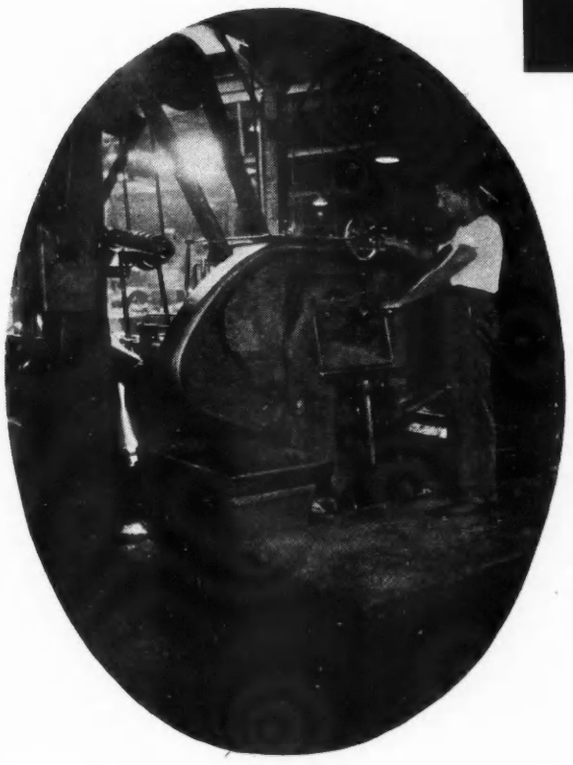
passage holes, and finishing the combustion chambers.

Similar equipment is used in machining the Diesel cylinder head at Muskegon, as will be noted. Here again the Baush and Natco multiple spindle drilling machines are used for drilling a variety of holes, miscellaneous holes being drilled with radials and several varieties of single spindle drill presses. Hammond tappers are used for tapping all holes.

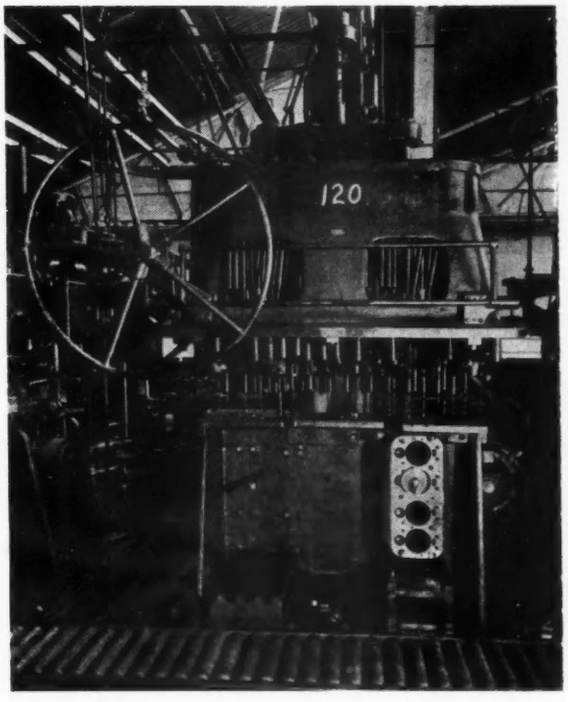
Due to the need for a fine fit between the bottom face of the head and the gasket face of the block, the head face is ground on a Pratt & Whitney surface grinder. As in the case of the block, the precision job of rough and finish-boring of combustion cups is handled on a heavy-duty Baker drill press.



(Above) Grinding both sides of JX-QX connecting rod, crank end, is done at Canton on this No. 84 Gardner disk grinder.



(Left) Osterholm automatic surface grinder is used in Canton gear cover department for finishing cover faces.



(Right) Drilling 17 holes in front end of Model DOO Diesel engine cylinder block at Muskegon

Crankshafts are purchased completely machined, routed to the crankshaft balance department in Canton for inspection and balancing. This department is equipped with five Gisholt dynamic balancing machines, single-spindle Baker and Barnes drills for balance drilling, as needed, and various inspection devices.

Cleanness is an attribute of machine shop operations, special washing machines being installed in many departments. Familiar piece of equipment for this purpose is the well-known Blakeslee "Niagara" washing machine which is found both in Canton and Muskegon.

A small department adjacent to "Trim and Storage" on the first floor of the Canton plant houses the two assembly lines on which the industrial power units are built. Engines for this purpose are drawn directly from the trim department after block testing; finished units are run under power, after assembly, to assure proper operation of all attachments.

Most interesting activity is found in the test room, lower right in floor plan on page 401, where every engine is block-tested with complete dynamometer schedule. As mentioned earlier, this department boasts 47 electric dynamometers.

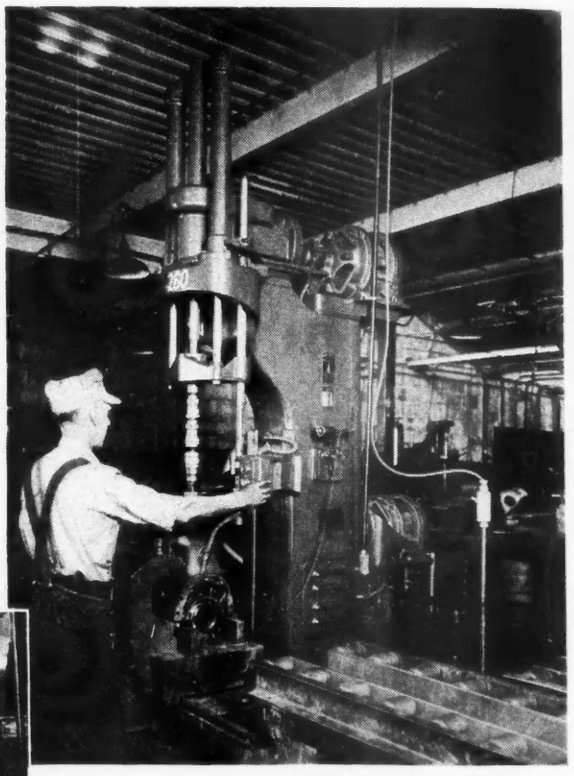
When engines are cleared by the test engineers, they are moved into the "Trim Department" which is immediately adjacent, where they are fitted with all detail attachment parts such as flywheels, fans and belts, air cleaners, starting motors, etc.

It may be noted that due to the variety of engines pouring into the test department it was found expedient to run engines stripped of all attachments, then to complete the assembly according to schedule in the trim department. Not only does this procedure facilitate handling on the test stands, but in the case of flywheels it would be impractical to mount the engines on the stands if the flywheel were attached. As it is, they use a standard dummy flywheel on the dynamometer drive shaft, attaching to the crankshaft flange.

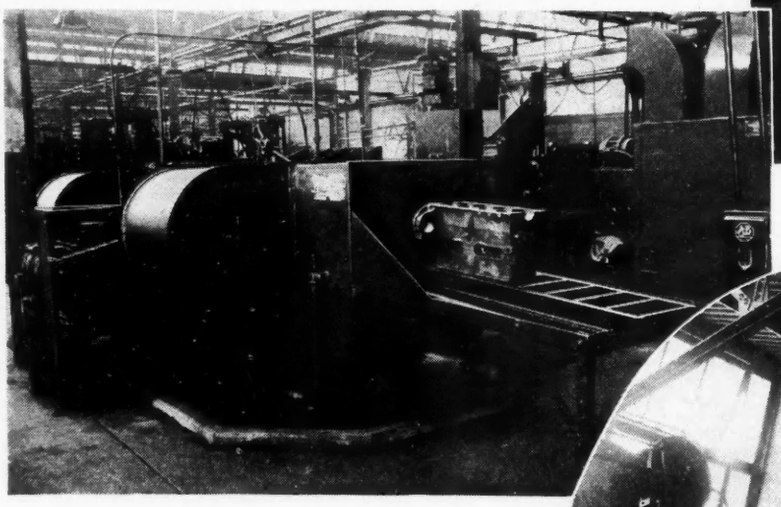
Here and there during the course of a day's run a few engines are rejected on the dynamometer test. Such engines are transported to the re-test department, torn down, inspected, and then reassembled after replacing offending parts and/or adjusting off-standard clearances. The engines then return to the dynamometer test for the final test and O.K.

Trim department has four separate lines, handling four different ranges of engine size. At the head of each line is a specially tooled engine lathe which is used for the final truing-up of the bell housing. For this operation the engine is accurately aligned with respect to the crankshaft and a cut is taken on the bell housing pilot to assure precise clutch alignment within plus or minus 0.005 in. (max.).

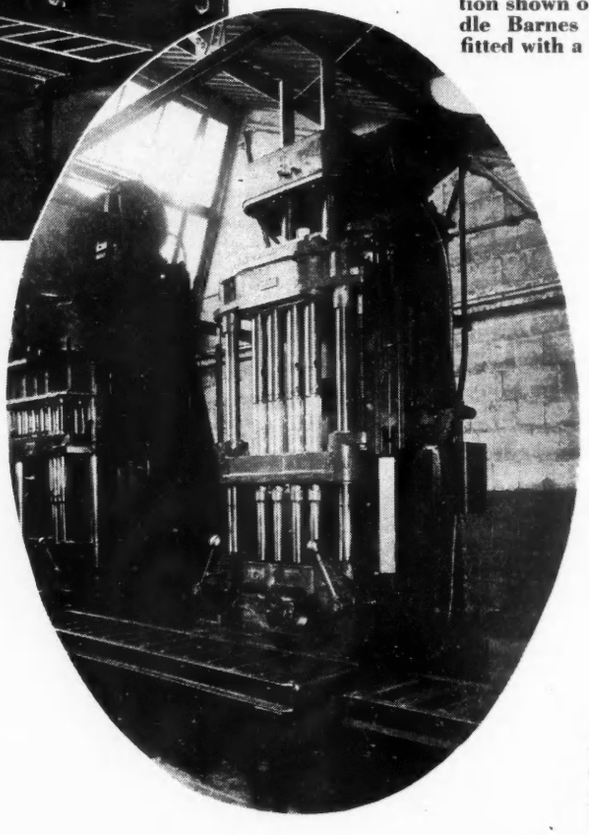
Roll inspection is another basic operation performed in the trim department, prior to assembly of attachment parts. Every engine that comes off the test stand goes first to roll inspection. Trained inspectors remove the oil pan, examine



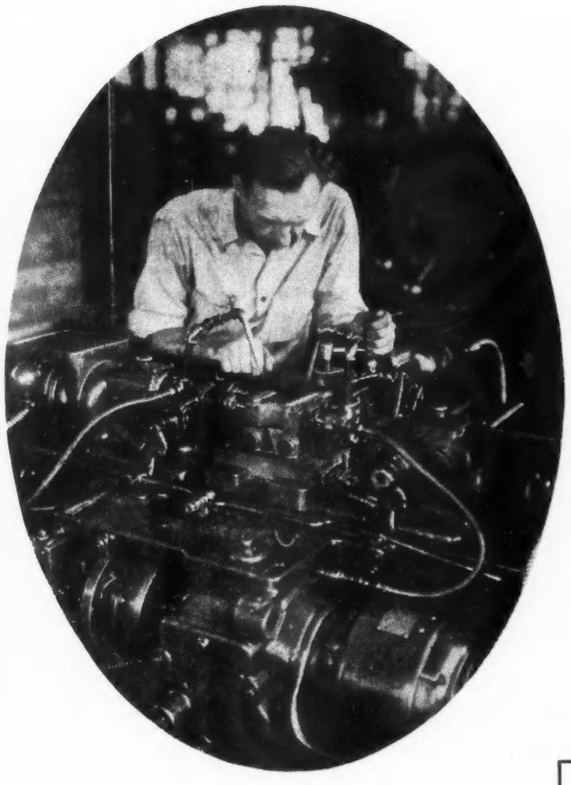
(Left) One of the new Blakeslee Niagara Washing machines installed at Muskegon for cleaning cylinder blocks prior to assembly operations



(Above) Diesel engine cylinder sleeves are honed after pressing into bores. Operation shown on this single spindle Barnes honing machine fitted with a Micromatic hone.



Rough boring Diesel engine cylinder block bores on four - spindle Moline Hole Hog.



Special set-up on Pratt & Whitney machine used at Canton for centering JX-QX con rods.

main bearings, rods, and cylinder walls before the engine is pronounced O.K.

The foregoing gives a quick but comprehensive picture of the quality control impressed on the finished product before it is considered satisfactory for shipment to the customer. Approved engines now go to the finished stores bay where they are ready for distribution—to the power unit department, for shipment.

Before leaving the main section of the manufacturing department, let us look in on the special bay for the production of non-current cylinder blocks. Here again the cylinder block is considered so specific a problem that the non-current parts for service or special orders are not handled on the regular machine lines. This department is equipped with the machine tools originally used for the production of parts now considered non-current. However, the smaller details such as flywheels, rods, covers, etc., are processed in the regular machine lines using suitable jigs and fixtures.

Unobtrusively apart from the hustle and bustle of the manufacturing activity, up at the extreme right corner of the building, is the "Service and Repair" department—one of the most important centers so far as the customer is concerned. This is the engine rebuilding department operated for the benefit of users of Hercules power.

Engines received in this department are torn down, washed, studiously inspected. Then the customer is given a formal quotation covering the cost of new parts, machining and testing. Perhaps the most important feature of the service is the fact that rebuilt engines all are subject to the formal block test and leave the plant with a new engine guarantee.

Finally we may note the huge finished stores department (lower left of floor plan) which has been expanded to provide storage for all manner of parts used in current production.

Engine Assembly—Second Floor, Canton Plant

Second floor gallery, the only second floor area at Canton, is used

Hercules Factory Routing

(Canton)

Gear Covers

Model JX-QX

OPERATION	EQUIPMENT
Snag	
Disc grind face to block	Osterholm automatic surface grinder
Drill 8 holes—face to block	24 in. Cincinnati drill
Mill oil pan face	Cincinnati No. 3 horizontal mill
Mill fan bracket pad	
Mill trunnion face	Cincinnati No. 3 vertical mill
Drill oil pan face (4)	24 in. Aurora drill
Drill fan pad (2)	
Spotface 8 engine holes	Allen drill—4 spindle sensitive
Drill 3 thrust holes	Allen drill—4 spindle sensitive
Spotface 3 thrust holes	Allen drill—4 spindle sensitive
Spotface 3 inside	Allen drill—4 spindle sensitive
Hollow mill inside	Allen drill—4 spindle sensitive
Tap 3 thrust screws	Hammond tapper
Tap 4 oil pan holes	Hammond tapper
Tap 2 fan pad holes	Hammond tapper
Bore crank hole	Quint turret drill
Rough and finish turn trunnion	
Groove crank hole	U. S. Machine Tool hand mill
Mill governor pad	Cincinnati No. 2 vertical mill
Mill motor support pads	Cincinnati No. 3 vertical mill
Drill governor pad—2 holes	Allen sensitive drill
Drill 1 hole through trunnion	24 in. Aurora drill
Drill 4 motor support pads	24 in. Aurora drill
Counterbore 4 motor support holes	24 in. Aurora drill
Countersink and tap 4 motor support holes	Hammond tapper
Countersink and tap 2 governor holes	Hammond tapper

Hercules Factory Routing (Canton)

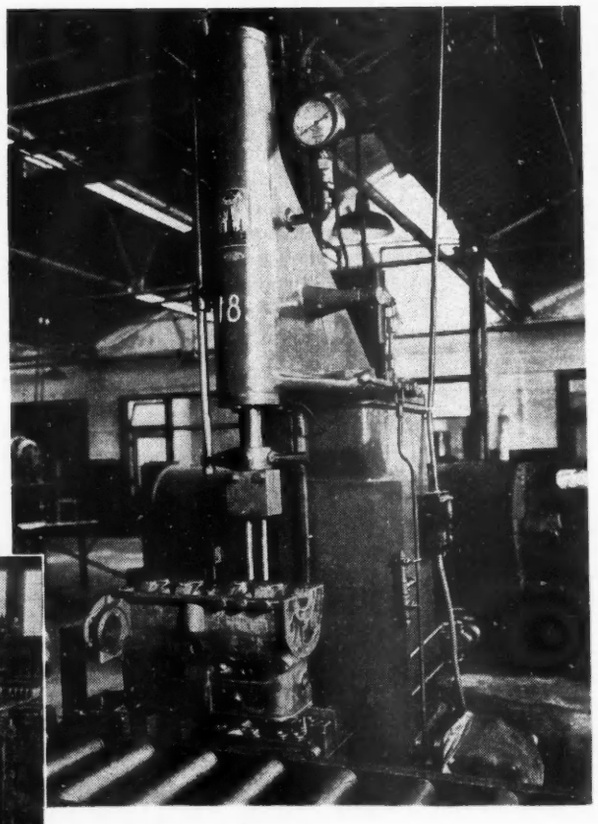
High Lead Rod and Cap (Combined Sequence) JX and QX

OPERATION	EQUIPMENT
Straighten rod	Bench
Center rod	Pratt & Whitney 3-way machine
Mill contact face	Ohio rotary mill
Rough surface grind contact face of cap	No. 4 Gardner disc grinder
Drill bolt hole in rod } simultaneously	Fox mutiple drill
Drill bolt hole in cap } simultaneously	
Drill large clamp screw hole	Cincinnati single spindle 20 in. drill press
Spotface clamp screw hole	Cincinnati single spindle 20 in. drill press
Spotface bolt hole on cap	Superior single spindle 20 in. drill press
Drill small clamp screw hole	Aurora single spindle 20 in. drill press
Tap clamp screw hole	Garvin tapper
Mill bolt release on rod	Cincinnati duplex mill 24 in.
Parkerize	
Straddle mill crank end of rod } simultaneously	Ohio rotary mill
Straddle mill crank end of cap } simultaneously	

OPERATION	EQUIPMENT
Finish disc grind contact face on cap	No. 4 Gardner disc grinder
Finish crank contact face of rod	No. 4 Gardner disc grinder
Drill and ream wrist pin hole	Natco multiple drill—(bore reamers)
Grind wrist pin hole	Heald Gagematic grinder
Notch cap	Hand mill—U. S. Machine Tool Co.
Notch rod only	Hand mill—U. S. Machine Tool Co.
Assembly for rough and finish bore crank end	Bench
Rough bore crank end of rod	4-spindle Baker drill
Finish bore crank end of rod	4-spindle Baker drill
Grind both sides, crank end	No. 84 Gardner disc grinder
Grind inside diameter crank end	Heald Gagematic grinder
Chamfer crankshaft bore	No. 310 Baker single spindle drill
Inspect crank end for size	Bench
Saw wrist pin slot	Cincinnati 18 in. horizontal power feed mill
Snag and burr rod and cap	Bench
Final inspection	Bench

exclusively for the assembly of engines. Here will be found six distinct assembly lines all featuring essentially the same sequence of operations, differing in detail only as to volume of production. The largest line is for the JX Series six-cylinder gasoline engines, shown at extreme left in the plan on pages 402 and 403. The other end of assembly department, also shown, handles the large Diesel engines.

In the interest of efficiency and space economy each of the lines is coiled about itself in approximately U-form with sub-assembly stations within the confines of each loop.



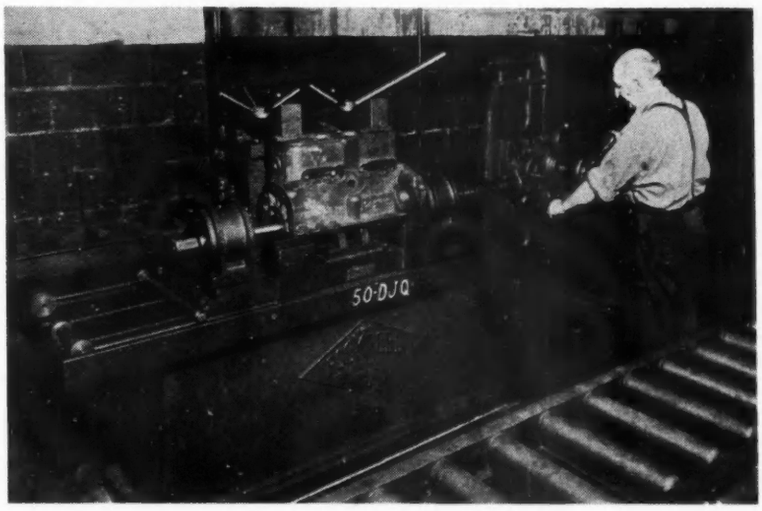
(Right) Pressing-in eight valve tappets and broaching, operation performed on this new American Broach & Machine Co., "Oil Broach," at Muskegon.

(Left) Close-up of the JX—QX high production engine assembly line at Canton.

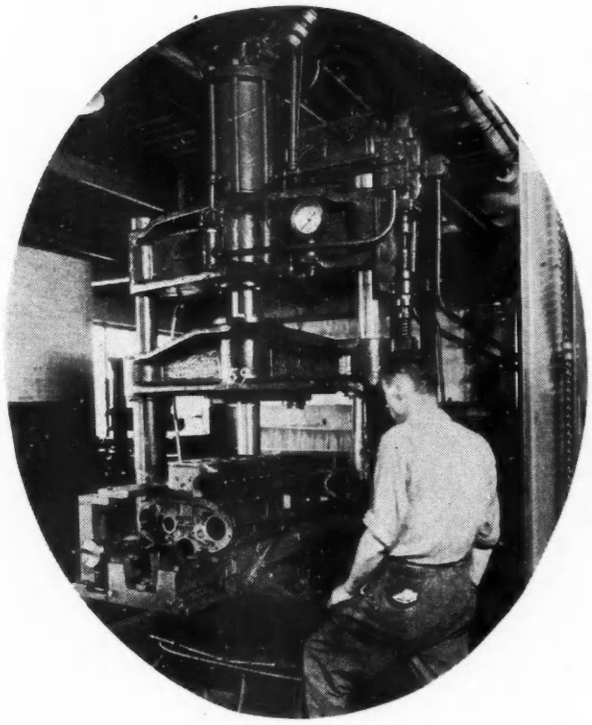
The big production line at the left is wound even more tightly in the form of a "G" to accommodate all operations within a relatively small space.

With the condensed plan of the second floor, we have reproduced a complete listing of detail assembly and sub-assembly operations performed on this floor. Stations corresponding to the operation key numbers will be found on the portion of the floor plan reproduced here, it being understood that some of the stations have been omitted.

At this point it may be appreciated how smoothly the flow of materials and parts is achieved. All machine shop operations are performed on the first floor, as described earlier. Then the machined parts as well as purchased parts are delivered to the assembly department according to schedule. Finally the finished engines are routed to the test department on the main floor for block test, final trim, and shipping.



(Above) Main bearing crank line is rough bored on this Rockford boring machine at Muskegon.



(Left) Oilgear hydraulic press is used for assembling cylinder sleeves in the Diesel blocks at Muskegon.

Diesel Development

Hercules was among the very first to visualize the tremendous market possibilities for the high-speed Diesel engine in the transportation field. As far back as twelve years ago—early in 1926—the company undertook some preliminary research work with a single-cylinder Dorner (German) Diesel design under a license agreement. After some time this experimental project was abandoned due to the limitations of the design, as well as the fact that a profitable market for the high-speed Diesel had not yet materialized.

In 1930 work on a high-speed Diesel engine was resumed with a single-cylinder experimental engine featuring the Hercules combustion chamber principle. From this point on, the development continued apace with improvement and perfection in the basic principle.

Late in 1932, Hercules built its first multi-cylinder Diesel engine—the "DHXB" six-cylinder, 5 in. bore x 6 in. stroke. Save for minor details and the naturally better materials available today, the present "DHXB" engine is the same as the first engine of the series. No fundamental changes have been found necessary in the combustion principle since the original single-cylinder engine was built in 1930.

A smaller six-cylinder Diesel—Model "DRXB," 4⅜ in. bore x 5¼ in. stroke, was placed in production in 1934 followed by the DJX series including the "DJXB" 3½ x 4½ in. and the "DJXC" 3¾ x 4½ in. six-cylinder engines. Latest addition rounding out the current line of Diesel engines is the "DOO" series four-cylinder engines built in three bore sizes—3¾ in., 4 in., and 4¼ in., all having a 4½ in. stroke.

Characteristic of all Hercules Diesels is interchangeability of each model with a gasoline engine of corresponding displacement. This is of fundamental importance to manufacturers using Hercules power since it is possible to offer the purchaser the options of either gasoline or Diesel power in a standard chassis.

Hercules users of Diesel engines include the following manufacturers of commercial vehicles: Autocar Co., Chevrolet Motor Co., Chrysler Corp., Dart Truck Co., Diamond T Motor Car Co., Federal Motor Truck Co., Four Wheel Drive Auto Co., Gramm Motor Truck Corp., Mack Manufacturing Co., Marmon-Herrington Co., Inc., Moreland Motor Truck Co., Oshkosh Motor Truck, Inc., Reo Motor Car Co., Studebaker Corp., Twin Coach Co., Walter Motor Truck Co., Ward LaFrance Truck Corp., The White Motor Co., Yellow Truck & Coach Manufacturing Co., and others.

Restyled Buicks for 1939

BUICK is offering four series of cars—the 40, 60, 80, and 90—with 18 body styles. These are distinguished by an entirely new appearance, having long, easy-flowing external lines combined with a unique front-end styling featuring two die-cast fender-apron side grilles, without the former center grille. The characteristics front-end styling is carried out in all models, with entirely new bodies for the Series 40 and 60.

Wheelbases are the same as last year, except on the Series 40, where it has been reduced 2 in., to 120 in. All of the important chassis features introduced last year are continued, most of them with improvements in detail. As regards the powerplants, the improvements are for the most part in the accessories, being found in the carburetor, choke, air cleaner, manifold and water pump, and in the engine mountings.

Shift levers under the steering wheels are standard equipment on all models, the mechanism having been redesigned for easier operation. The Series 40 transmission is entirely new, and this Series also has a new clutch, of the type having a single, one-piece corrugated clutch spring. All series have new driven disks for the clutches.

Frames for the Series 40 and 60 have been redesigned, and their box-section side rails now terminate just above the rear axle. To enable the body to carry the gasoline tank, bumpers, and luggage without direct support from the frame, it has been suitably strengthened.

Independent front-wheel suspension on coil springs is continued, double-acting shock absorbers being used. On the Series 40 and 60 the geometry of the front suspension has been improved.

The essential features of the 1938 rear axle and coil-spring suspension have been retained, but the stability of the rear end has been increased by the provision of channel-section strut rods, and in the Series 40 and 60 the torque ball is now located at the central cross member of the frame. All series have new rear shock absorbers and softer rear springs. The master cylinder and the pedal mounting of the hydraulic braking system were changed to further reduce the pedal effort required. A new, attractively-colored steering wheel has been adopted, as well as a new type of steering-column lock and bracket.

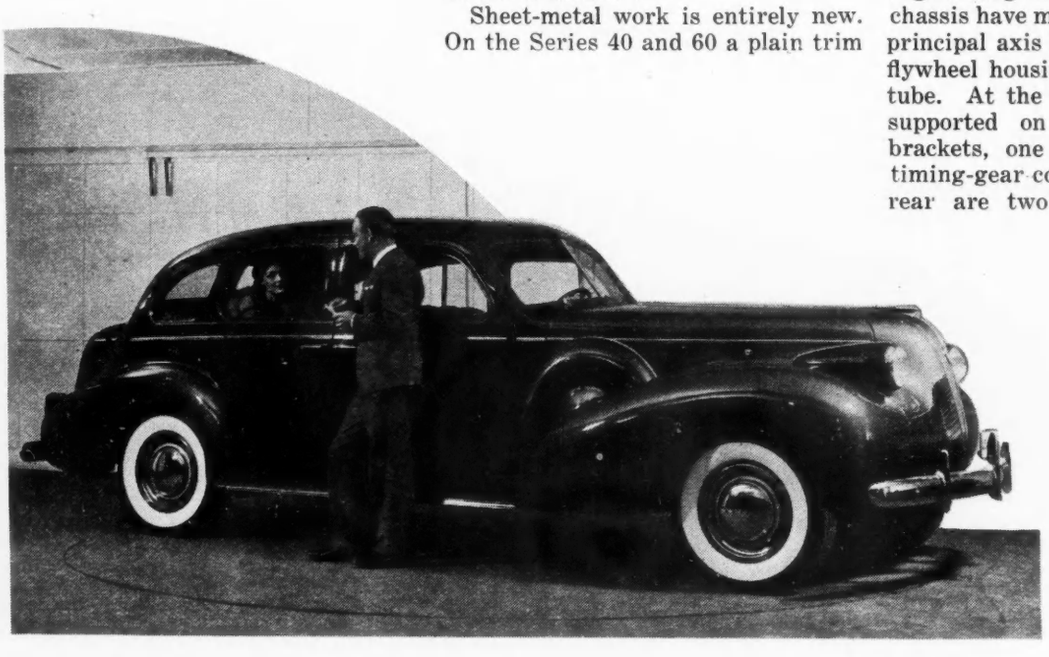
Sheet-metal work is entirely new. On the Series 40 and 60 a plain trim strip is available as optional equipment, instead of running boards. Head lamps, tail lamps, and fender lamps have been redesigned to harmonize with the new style.

Sunshine top equipment is offered as optional factory equipment on the Series 40 two- and four-door touring sedans and on the Series 60 four-door touring sedan. A section of this roof can be slid back to open the body.

To open the top a section is pushed back under the rear part of the Turret Top, and to close the opening the same section is pulled forward. When closing the top a cam arrangement forces the moveable section upward sufficiently to make it flush with the surrounding top of the car.

Series 40 has a valve-in-head, straight-eight engine of 3 3/32-in. bore by 4⅛-in. stroke (248 cu. in. displacement), which is rated 107 hp. at 3400 r.p.m., with cast-iron head and 6.15-to-1 compression ratio. Series 60, 80 and 90 have a valve-in-head, straight-eight engine of 3 7/16-in. bore by 4 5/16-in. stroke (320 cu. in. displacement), rated 141 hp. at 3600 r.p.m. with cast-iron head and 6.25-to-1 compression ratio.

On both the 40 and 60, the new low bodies necessitated a radical change in the torque-tube drive and engine alignment. Engines in both chassis have mountings which tilt the principal axis 5½ deg., lowering the flywheel housing to meet the torque tube. At the front, the engines are supported on two rubber-to-metal brackets, one on each side of the timing-gear cover support. At the rear are two new supports, on a



The 80 Roadmaster six-passenger sedan has the front end styling distinguished by all of the Buick line.

Are Offered in Four Series

frame cross member, one on each side of the flywheel housing. The transmission steady-rest and brace has been eliminated on the 40 and 60.

Simplified down-draft carburetors are used with an improved accelerator pump for fast idling. The carburetor embodies an integral automatic choke. Tilting of the engine has led to a redesign of the intake manifolding. Heat supply to the manifold is controlled by an automatic thermostatic valve. The carburetor also carries a new vacuum-controlled starting-motor switch, connected to the accelerator linkage. Vacuum from the intake manifold automatically opens the switch when the engine is running. The Series 40 engine has a more positive oil seal at the rear main bearing. The new "crown spring" clutch, has only nine parts, as compared with 41 parts in last years assembly. Its principal element is a conical disk spring with a corrugated surface, made from steel. This clutch, as well as the other clutches in the Buick line, has a new clutch driven plate with a strong but much lighter hub, which reduces the inertia by almost one-third. As a result, driven plate spinning after disengagement is considerably reduced, permitting faster and easier shifting.

Clutch linkage and controls have been completely redesigned for all Series. The clutch pedal is mounted on the frame, as on the present Series 40. The "over-center" pedal-return spring construction introduced on the 1938 Series 60, 80 and 90 will be continued, and also used on the 40. The release yoke is new, and may be easily withdrawn from the clutch housing. A new clutch-release bearing sleeve has been developed which is one piece except for the riveted-on yoke retainer spring. A new method of fastening the release yoke to the sleeve, with hardened pins set in each side of the open end, makes it easier to assemble or disassemble, and provides a more secure and easier operating release.

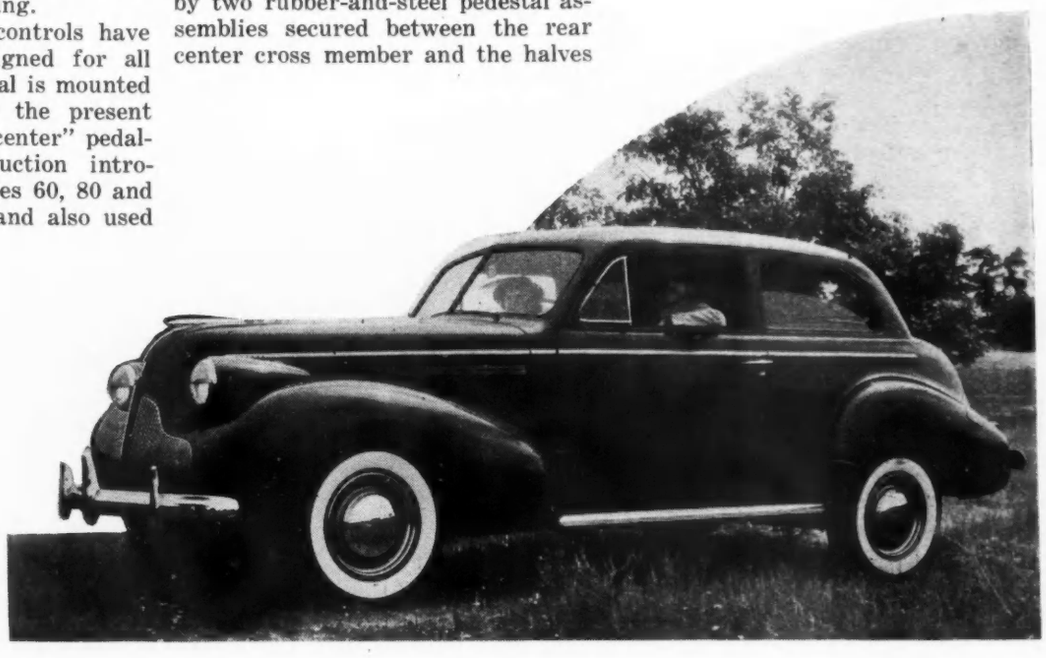
Front-suspension systems are continued unchanged, except that Series 40 and 60 have lower control arms and a new rubber bumper; that rubber bushings replace the metal bushings in the inner ends of the lower control arm at the frame, and that front shock absorbers have a housing of different shape and a new type of arm to conform to the improved suspension geometry.

Major changes have been effected in the rear axle and wheel suspension system on 40 and 60 models. In the first place, the torque-tube drive now is made in two separate sections, one extending from the transmission-rear-bearing retainer to the torque-ball retainers at the frame center crossmember, the other from the retainers to the differential carrier. The torque ball, universal joint, and retainers are supported by two rubber-and-steel pedestal assemblies secured between the rear center cross member and the halves of the torque-ball outer retainer. The rear torque tube is welded to a steel insert which is cast into the front end of the differential carrier.

This construction not only permits of a low rear-compartment floor without a high tunnel, but has been found to improve the ride materially. The method of attaching the rear torque tube to the torque ball is essentially the same, except that a rubber coating is now vulcanized to the torque ball, and treated to make it self-lubricating. The friction between the inner and outer retainers on the rubber-coated torque ball damps out rear-wheel and axle bounce, and the rubber coating also provides a definite barrier to "rolling noise." A double-row, shielded ball-bearing assembly is incorporated in the front end mounting of the rear drive pinion.

The rear tubular propeller shaft is the same as before, but shorter. The universal joint, which requires no lubrication in service, is located in the torque ball at the frame center cross member, and a short tubular shaft extends to the transmission

(Turn to page 416, please)

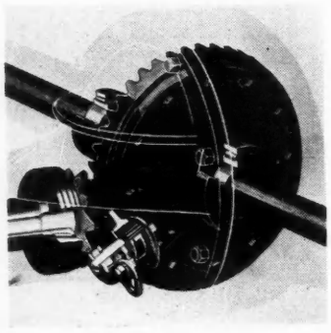


This new Buick 40 special two-door sedan has a valve-in-head, straight-eight engine

A New Super-Eight is

A NEW Super-Eight series, intended to sell at a lower price level, leads the Packard line for 1939, which comprises the Six, the Eight (formerly 120), the Super Eight, and the Twelve. As in past years, Packard styling retains its characteristic pattern, with only slight modifications in detail.

The Six has a 122-in. wheelbase, the Eight and Super Eight, 127-in., the Twelve, 134⅜ in. These are the basic chassis for five-passenger sedan bodies. Each series has a rather complete selection of models.



Phantom view of the Packard hypoid rear axle with special roller bearing cage retainer which is added on the Super Eight. It is adjusted to limit maximum deflection of ring gears to 0.005 in.

The Super Eight is a new car mounted on the Eight chassis and featuring many of the Junior line units and improvements, including the Junior line body shell. It will, however, embody the Super Eight engine with refinements. In addition, the interior trim, hardware, accessories, etc., will be in keeping with Super Eight tradition.

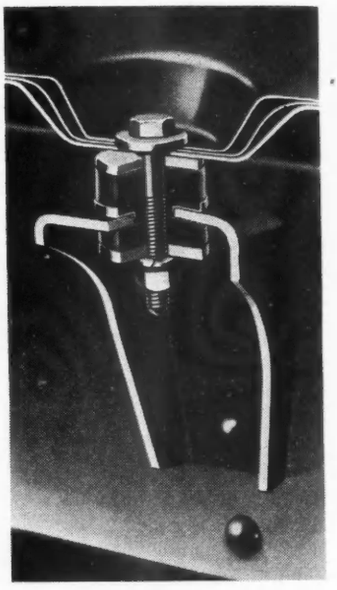
The Packard Six, Eight and Super Eight embody such advanced engineering features as remote-control gear shifting as standard equipment, a new suspension system, a new transmission designed for remote control; and the new solenoid-controlled overdrive transmission as optional equipment. The Twelve is continued without material change. Evans power shift is standard on the Twelve.

The six-cylinder engine is an L-head of 3½-in. bore by 4¼-in. stroke (245 cu. in. displacement) and is rated 100 hp. at 3200 r.p.m., with cast-iron head and 6.52 compression ratio.

The Eight has an eight-cylinder in-line L-head engine of 3¼-in. bore by 4¼-in. stroke (262 cu. in. displacement), rated 120 hp. at 3600 r.p.m., with cast-iron head and 6.6 compression ratio.

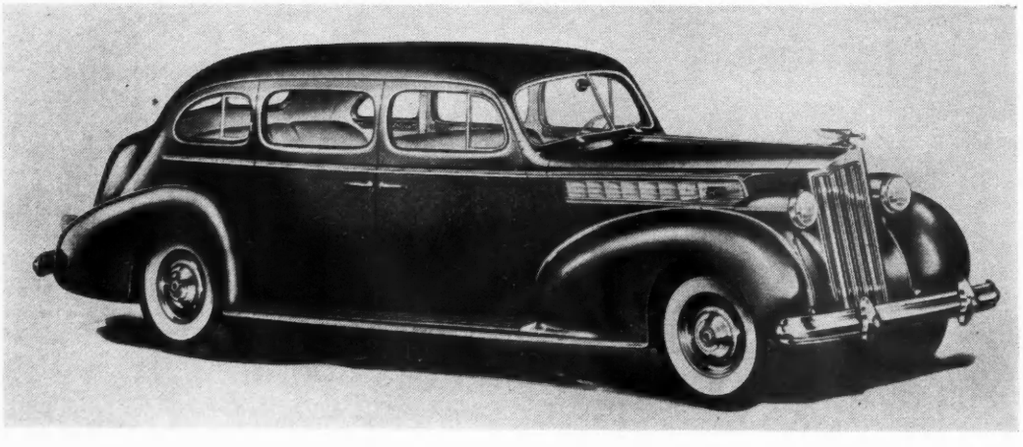
The Super-Eight engine is an eight-cylinder in-line of 3 3/16-in. bore by 5-in. stroke (320 cu. in. displacement) rated 130 hp. at 3200 r.p.m., with cast iron head and a compression ratio of 6.5.

The Packard Twelve has a V12 engine of 3 7/16-in. bore by 4¼-in. stroke (473 cu. in. displacement) rated 175 hp. at 3200 r.p.m. with aluminum heads and 6.4 compression ratio.



New high absorption capacity body mountings are used on the Six, Eight and Super Eight. Insulating members are of special molded rubber and fabric composition.

Both the Six and Eight have a new malleable iron camshaft, Tocco-hardened. These engines also are equipped with a new Morse timing chain having a special link design



The Super 8 four-door sedan is powered by an eight-cylinder in-line engine of 130 hp. and a compression ratio of 6.5.

Packard's '39 Innovation

that prevents sagging between sprockets, thereby eliminating all tendency to whip, sag, and rattle. Special Palnut fastenings, which eliminate cotter keys, are used on the Six and Eight connecting rods. The Six, Eight, and Super Eight have a new four-bladed asymmetrical blade fan, with two blades serrated to reduce noise.

New connecting-rod bearings of full cylindrical form, babbitted, are used on the Six, Eight, and Super Eight.

The carburetor on the Eight now has a built-in automatic choke operated by exhaust heat.

Auto-Lite electrical equipment is used on all models, -with current-voltage control on the Super Eight and Twelve, and vibrator voltage control on the Six and Eight.

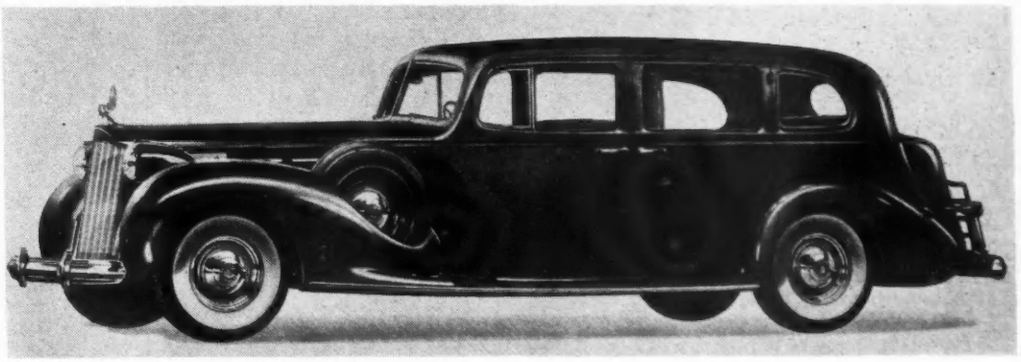
The water pump on the Super Eight now is of the packless, permanently-sealed-and-lubricated type, with a double-row preloaded ball bearing on the shaft.

On the Super-Eight the clutch-pedal linkage has been improved by the addition of three anti-friction bearings and by the provision of an "over-center" spring on the clutch pedal. This reduces the pedal pressure required materially. A vacuum booster is standard in the clutch and brake linkage of the Twelve.

The most important change in the Six, Eight and Super-Eight is the new suspension system, which is described as "a damped elastic system which eliminates all transverse vibration." One of the suspension problems of modern cars has been that of controlling side shake originating in road shock. Packard has developed a complete suspension system in which the vibration is damped by means of a fifth shock absorber mounted in the rear stabilizer linkage. The complete system also incorporates new rear springs, and a special shock absorber mounting in the front suspension. It is claimed for the new suspension that it permits a reduction in frame weight, reduces oversteering, improves handling of the car on all kinds of road surfaces and at all speeds, and gives the feeling of softer tires.

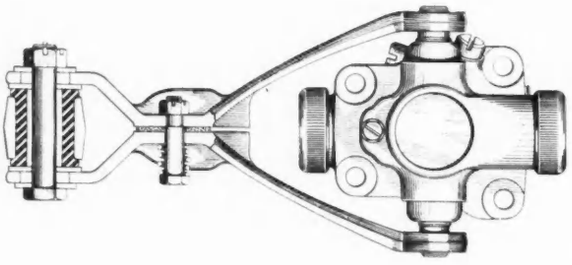
As illustrated, the fifth shock absorber is a specially-calibrated Houde unit, quite similar to the regular type mounted in the rear stabilizer arm. Calibration of the unit being the same for movements in both directions, there is no fussy adjust-

The Six is powered by an L-head engine of 100 hp. and has body lines characteristic to the Packard make.



The twelve follows the same trend in body design as the other models but has more sweeping lines on the longer wheelbase. The engine is a V-12 generating 175 hp.

ment for length of stabilizer arm. Supplementing the action at the rear is a new form of shock absorber arm in the independent front suspension. The forging is made in two sections, retained at the center by a tension fastening, holding a friction lining between the arms. The fastening permits slight relative movement between the arm sections, and in this manner absorbs the almost imperceptible quivers that otherwise are perceptible as high-frequency transverse vibrations.



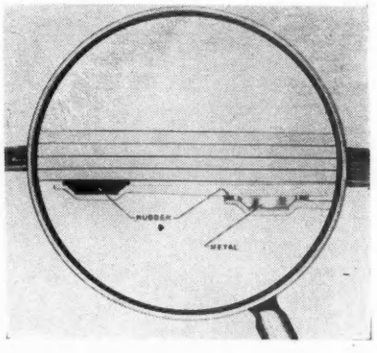
Detail of new front shock absorber arm showing split arm construction with tension fastening design, to absorb high frequency vibrations.

Last year Packard pioneered rear leaf springs with special metallic button inserts at the leaf ends. This friction-control button arrangement has been altered considerably, there being molded-rubber inserts on all spring leaves except the last three. The latter are fitted with high-antimony-lead buttons housed in a special brass retainer with a molded-rubber seal to hold lubrication. The function of the lead inserts is to provide positive damping of low-frequency vibrations and also to give full-load passenger loading control. Their use simplifies the problem of shock-absorber calibration.

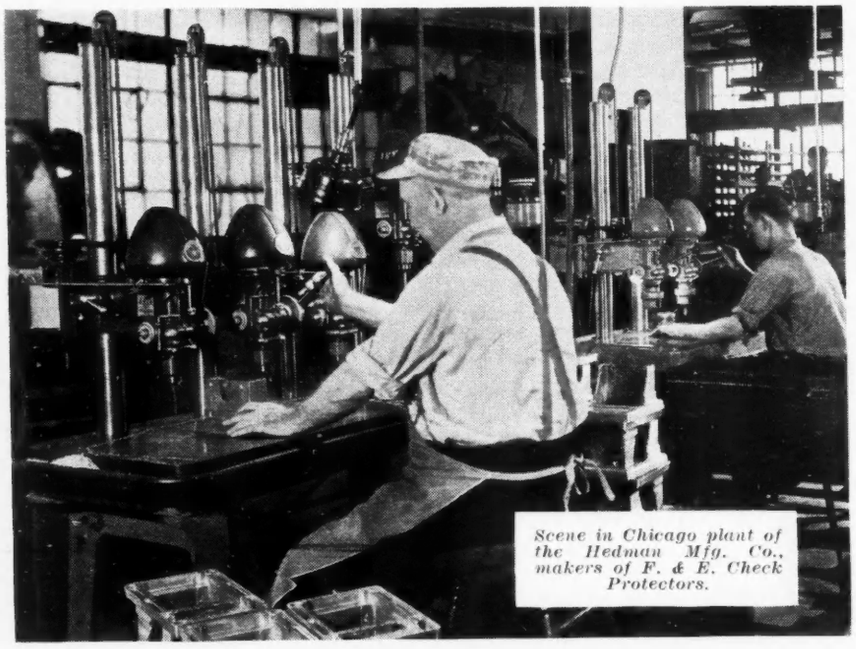
For export, the rear springs have ten leaves and are fitted with a combination of lead and rubber disks, as well as John Warren Watson Silento inserts.

On the Six, Eight, and Super Eight lines, gear shifting is by means of the lever conveniently mounted under the steering wheel. Gear-shift and cross-over movements are performed by separate mechanical linkages connecting to levers outside the transmission case. A unique feature of the Packard hook-up is a molded-rubber insert at the steering-column connection of the shifter handle, to take care of the cross-over movement.

In line with the adoption of remote control, the transmission for the Six, Eight, and Super Eight—used interchangeably on all three—has been redesigned so as to incorporate the features of the Packard Twelve unit. All gears, except re-



Magnified view of lead inserts in two lower leaves of rear springs for the Six, Eight and Super Eight. The lead disks are held in a formed brass retainer and sealed with a molded rubber cup.



Scene in Chicago plant of the Hedman Mfg. Co., makers of F. & E. Check Protectors.

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verse, now are constant-mesh with toothed clutches for engagement. The transmission is provided with anti-friction bearings at all points, pre-loaded ball bearings being used for mounting the third- and second-speed gears.

The Twelve now has needle-bearing universal joints with provision for positive lubrication, protected by a relief valve.

An optional feature offered with all lines except the Twelve is the new solenoid-controlled overdrive transmission. The overdrive cuts in automatically at around 30 m.p.h. but can be made to shift down into direct drive instantaneously by simply depressing the pedal sharply. This is accomplished by means of a special electrical hook-up connected with the pedal. There are two solenoids in the mechanism, which pull out and hold the locking pawl, while in direct drive and traveling at above overdrive cut-in speed. Simultaneously with the operation of the solenoid, a special switch cuts the ignition circuit momentarily, so that the engine misses from one to three cycles, during which period, while a reversal of torque occurs, the holding pawl can be withdrawn easily.

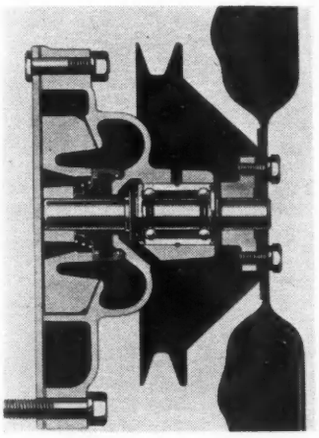
For the sake of safety, the circuit is so arranged that the ignition switch can be opened only while the pawl is engaged. In addition, there is an auxiliary switch arranged to break the ground circuit in the event something goes wrong in the overdrive, thus continuing the ignition. This switch is actuated by releasing the pedal.

The Packard overdrive unit has a number of special features designed to provide surplus capacity for the heavy torque of the Super-Eight engine. Thus the tail shaft is rigidly mounted, with a special rear-bearing retainer carrying two pre-loaded ball bearings assembled with zero clearance. The clutch member and pawls are of increased capacity, for the same reason. Wherever the overdrive is specified, Packard supplies a vacuum control for the throttle at low engine speeds. This prevents the engine from stalling in heavy traffic when the vehicle is coasting in overdrive.

The same hypoid rear axle is used on the Six, Eight, and Super Eight. However, the unit for the Super Eight is fitted with a mechanism to take the torque of the big engine. This consists of a roller-cage bearing for the ring-gear support, so fitted as to limit the deflection of the ring gear at the point of contact to a maximum of 0.005 in.

A rear-axle ratio of 4.36 is standard, while 4.54 is used with the overdrive.

The steering hook-up and geometry remain the same, the Junior steering gear having been adopted also for the Super Eight chassis.



New water pump and fan mounting on the Super Eight Engine.

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Ryerson Certified Steels offer you the maximum value for your steel dollar. They represent the highest quality obtainable in each classification. They are controlled by definite specifications based on the requirements of each particular type.

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We will be glad to tell you more about Ryerson Certified Steel—which is, in truth, a bargain when uniform quality and dependable results are considered. Bulletin 10 provides complete information on the Ryerson Certified Steel Plan. The Ryerson Stock List gives descriptions, extras, sizes and lengths of all steel in stock.

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However, wheel camber and caster have been changed on all three models.

As mentioned earlier, the styling remains characteristically Packard in all respects. The Super Eight has the same body shell as the Junior models, with new hood-louver treatment and long bright body molding strips. Both the Super Eight and Twelve have a special steering wheel, with two circular-section arms. The Super Eight interior is embellished by a plastic instrument panel with large plastic inserts molded over steel backs. The instrument treatment is novel on all models, with illuminated numeral discs on the speedometer face.

Interiors of all trunk compartments are coated with an insulating spray which has the appearance of a suede fabric. Rubberized-fabric body mountings of high absorptive capacity absorb high-frequency vibrations. The number of body mountings has been reduced, and the mountings are located at points of minimum vibration on the frame. The body structure is completely insulated from the running gear, not only through the medium of the new body mountings, but also by rubber members at the connections of the front and rear suspensions.

BUICKS

for the 1939 season are offered in four series

(Continued from page 411)

main shaft. The forward end of the front propeller shaft is internally splined to fit over the transmission main shaft.

Channel-section strut rods are bolted at the front end to a bracket welded to the torque tube. Spring seats are integral with the strut rods at the rear end, and both are secured to the axle housing with U bolts. The new radius rod is supported in rubber bushings at both frame and axle. Shock absorbers with cast-iron housings, mounted on the inner side of the frame side rail, replace the direct-acting type used last year. The shock absorber arms are connected to the rear end of the strut rods near the axle housing, by means of links insulated with rubber grommets.

Two optional rear axles are offered on the Series 40 and 60. For all-around performance there is a standard ratio of 4.4 on the 40 and 3.9 on the 60. For those who want high speed and superior fuel economy in level country, there is an optional ratio of 3.9 for the 40 and 3.6 for the 60.

In the gear-shift mechanism the lever under the steering wheel operates a shaft enclosed in a tube that extends parallel with the steering column, the shaft at its lower end connecting to the transmission through a linkage. Series 40 has a new transmission housing specially adapted to the new shift and cross-over linkage. The transmission is more compact and lighter in weight, but more rigid, for which reason it is expected to give better service life. Its mainshaft is piloted in larger cageless roller bearings. Gear ratios in first and reverse have been changed to permit faster acceleration in low gear. The rear bearing retainer has been redesigned to accommodate the new torque-tube drive. Series 60, 80 and 90 transmissions also have the new shift mechanism and the new rear-bearing retainer to accomodate the torque-tube drive.

Bodies for the 40 and 60 Series are entirely new and of Unisteel construction. Not only is there greater visibility over the front end of all

THE SOLID SHIM
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FOR ADJUSTMENT
• compensates for wear
These Diesel engines have used Laminum shims the past six years, for adjusting main and connecting rod bearings and journal caps. (Babbitt-tipped shims are specified, to maintain close oil and pressure seal.) "Adjustments should be made after about .003-inch wear," RATHBUN-JONES recommend, emphasizing the continuous precision-adjustment feature afforded by Laminum shims during machine life. They praise, too, the ease of handling. Write for Laminum sample.
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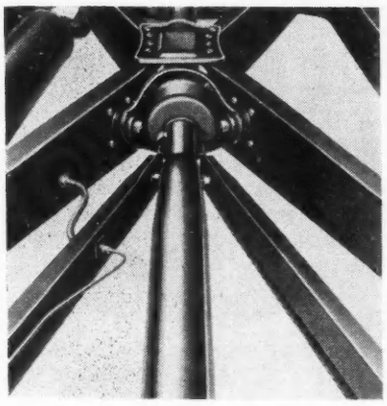
LAMINUM
Precision adjustment SHIMS

models, but, in the Series 40 and 60 bodies, the areas of the glass openings have been increased. The windshield has 26 per cent more glass than in 1938, the front-door windows 11 per cent more, the rear side windows 52 per cent more, and the rear window 21 per cent more.

Front-end styling characterizing the entire line features die-cast, chromium-plated radiator grilles mounted in the front-fender aprons just above the bumper line. There is no center grille, the hood line being faired into the front-end sheet metal in a graceful tapered line.

Hood louvres are decorated only by four chrome-plated strips approximately 1/8 in. wide. They are approximately 18 inches long on the Series 40 and 60, and 22 in. on the Series 60, 80 and 90. They are unique in that the hood-latch handle is integral with the louvre and appears to be part of it when closed.



Mounting of front end of torque tube on Buick 40 and 60 showing the rubber insulation and channel strut rods.

Larger headlamps are outlined with a narrow steel molding around the side. Windshields and rear windows of the Series 60, 80 and 90 bodies, as well as all window reveals on the Series 60 are surrounded with a stainless-steel molding. Another feature of the new styling on the 40 and 60 is the use of "stream boards," that is, narrow strips set off with stainless-steel moldings, which are offered in place of the regular running boards wherever specified. When "stream boards" are desired, the front end of the rear fenders is fitted with a rubber scuff pad vulcanized to a steel insert.

On the Series 40 and 60 the vision is improved by a narrow front-door-hinge pillar, a wider and higher windshield, and large windows. Also, the rear door window is without division bar. On the Series 40 and 60 outside front door locks are provided for both front doors and are located immediately below the door handles, while on the Series 80 and 90 the locks are in the door handles. On Series 40 and 60 models the upper front and both rear door hinges are concealed, while on convertible models only the upper hinge of the front door is concealed. Convertible models only the upper hinge and 60 fold flush with the body into a sling, which makes the whole trunk capacity available when the top is up.

Rear-quarter windows of the Series 40 and 60 can be moved fore-and-aft by means of an inside manual control. Sport coupes have a sliding rear-quarter glass providing a 4-in. opening. The rear-quarter glass in the Series 40 business coupe is stationary.

Headlamps of all models are shaped at the bottom to fit the contour of the fender near the radiator shell. Headlamp lenses are larger than in 1938. The twin tail lamps on the Series 40 and 60 now have more reflector surface. They are mounted on the body at approximately the same height as last-year's

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fender lamps. Series 80 and 90 rear-fender lamps are unchanged.

All models have a new trunk emblem combined with the Flash-Way direction signal. With this signal, when the driver wishes to indicate a turn, he flips a switch mounted on the shift lever, which illuminates an arrow at one or the other end of the lamp, depending upon whether he wants to turn to the right or the left. The flashing light compels attention.

Convertible coupes have opera seats instead of rumble seats.

Except on Model 90-L, all front seats are fully adjustable. They have a 4-in. fore-and-aft movement and are ¾-in. higher in the forward than in the extreme rear position. Simultaneously with the seat, the seat-back is adjusted, the latter being nearly vertical when the seat is forward and sloped slightly to the rear when it is back. All models are provided with arm rests at the ends of the seat. In all Series 80 and 90 models and in Series 60 four-door sedans the rear seat has an additional center arm rest, which can be folded into the seat back to make room for an extra passenger.

URW Re-Elects Executive Heads; Drafts Legislative Program

United Rubber Workers of America, at their third annual convention which closed Sept. 25, at Trenton, N. J., re-elected their three principal executive officers, with Sherman H. Dalrymple, of Akron, president; Thomas P. Burns, of Chicopee Falls, Mass., vice-president; and Frank Grillo, of Los Angeles, secretary-treasurer.

Drafting of a legislative program was completed with endorsement of measures that would limit the use of national guard troops in labor disputes, impose taxes on chain stores, set up government life insurance systems and broaden the social security act. The convention went on record as strongly in favor of the extension of federal low-cost housing projects.

Direct endorsement of the general welfare act, said to embody the Townsend plan, was side-stepped by the union. On recommendation of the legislative committee, the delegates voted non-concurrence in a resolution favoring the act but endorsed the principle of old age pensions and urged congress to enact improvements in the social security act.

Another resolution commended the activities of the Senate civil liberties committee and urged that the scope of its activities be widened. Concerning government finances, the delegates went on record as favoring removal of tax exemptions from government bonds and endorsed a monetary control bill introduced by Representative Charles G. Binderup, of Nebraska.

Reunion of the American Federation of Labor and the Committee for Industrial Organization was proposed in a special resolution adopted by the Convention. This follows by a few weeks the prediction of eventual reunion of the two bodies made by Secretary of Labor Frances Perkins and the intimation along those lines by Homer Martin, president of the United Automobile Workers of America, the second largest CIO affiliate.

In anticipation of such a reunion, industrial leaders were reported to be ready to go forward with a plan for periodic conferences with representatives of labor when the schism has been healed. The set-up of proposed committees in the plan has been drafted, it was said, but the actual personnel has not been named.

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The plan would be somewhat similar to the British program.

As long as the rift exists between the A. F. of L. and the CIO, it was declared, such conferences will be impossible, since an employer negotiating with one group cannot turn to the other and confer without aggravating a situation.

No machinery for enforcement would be established under the plan. Codes of ethics would be worked out, it was explained, and their enforcement would be left largely to the force of public opinion.

It was indicated that in addition, representatives of both industry and labor under such an arrangement might discuss the Federal tax program, foreign trade policy, and such measures as the Reorganization Bill, defeated in the last session of Congress. This would enable both sides to determine if a proposal were likely to be detrimental to industry and jobs, and, therefore, to decide on the stand to be taken.

August Casing Shipments Pass July by 2.5 Per Cent

Shipments of pneumatic casings during the month of August, 1938, estimated at 4,045,540 units by the Rubber Manufacturers Association, inc., increased 2.5 per cent over shipments made in July. Although August shipments were 17.3 per cent below shipments for August, 1937, there was a continuation of the favorable trend beginning in March, 1938, since when shipments each month have compared more favorably with the corresponding month of last year.

The association estimates production of pneumatic casings for August at 4,093,234 units which is the highest monthly production since September, 1937, and represents an increase of 22.1 per cent above July, and 2.8 per cent above August, 1937.

Pneumatic casings in the hands of manufacturers, Aug. 31, are estimated at 8,329,590 units. This is 1.6 per cent over stocks on hand July 31, but 23 per cent below those of Aug. 31, 1937.

Graham-Paige Announces Prices for 1939 Line

Graham-Paige Motors Corp. has announced 1939 prices of $940 (delivered in Detroit) for a combination coupe or two door sedan and $965 for a four-door sedan. Price of the four-door sedan has been reduced $122 as compared with the 1938 model. The other two body types were not in the line this year.

Monthly Motor Vehicle Production—U. S. and Canada

	Passenger Cars		Trucks		Total Motor Vehicles	
	1938	1937	1938	1937	1938	1937
January	168,890	324,191	58,240	74,995	227,130	399,186
February	151,133	310,961	51,456	72,939	202,589	383,900
March	186,341	423,006	52,257	96,016	238,598	519,022
April	190,111	452,907	48,022	100,324	238,133	553,231
May	168,599	443,412	41,584	96,965	210,183	540,377
June	147,545	429,333	41,854	91,820	189,399	521,153
July	112,114	372,913	38,330	83,996	150,444	456,909
August	61,687	317,270	35,249	87,802	96,936	405,072
September	.....	120,597	.....	55,033	.....	175,630
October	.....	306,040	.....	31,939	.....	337,979
November	.....	309,121	.....	67,508	.....	376,629
December	.....	258,769	.....	88,117	.....	346,886
Total	.....	4,068,520	.....	947,454	.....	5,015,974

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Calendar of Coming Events

CONVENTIONS AND MEETINGS

National Lubricating Grease Institute, Annual Convention, Chicago ..Oct. 3-4
SAE National Truck, Bus & Railcar Meeting, Chicago .....Oct. 4-5
American Society of Mechanical Engineers Meeting, Providence.....Oct. 5-7
SAE National Regional Fuel and Lubricants Meeting, Tulsa, Okla..Oct. 6-7
SAE National Aircraft Production Meeting, Los Angeles .....Oct. 13-15
A.S.T.E. Annual Meeting, Pittsburgh, Oct. 14-15
National Metal Exposition, Detroit, Oct. 17-21
American Welding Society Meeting, Detroit .....Oct. 17-21
SAE Annual Dinner, New York....Nov. 14
National Association of Finance Companies, Annual Convention, Chicago, ...Nov. 14-15
SAE National Transportation Engineering Meeting, New York....Nov. 14-16
National Safety Council Meeting, Chicago .....Nov. 14-18
American Petroleum Institute Meeting, Chicago .....Nov. 14-18
National Industrial Traffic League Meeting, New York .....Nov. 17-18
Automotive Service Industries Show, Chicago .....Dec. 5-10
National Standard Parts Association Meeting, Chicago .....Dec. 2-3
National Motor Boat Show, New York, Jan. 6-14
SAE Annual Meeting, Detroit.....Jan. 9-13

SHOWS

20th Annual National Metal Exposition, Detroit .....Oct. 17-21
New York, National Motor Truck Show, Nov. 11-17
New York, National Automobile Show, Nov. 11-18
Pittsburgh, Pa., Automobile Show, Nov. 11-18
Detroit, Mich., Automobile Show, Nov. 11-19
Columbus, Ohio, Automobile Show, Nov. 12-18
Buffalo, N. Y., Automobile Show.Nov. 12-19
Chicago, Ill., Automobile Show.Nov. 12-19
Milwaukee, Wis., Automobile Show, Nov. 12-19
Minneapolis, Minn., Automobile Show, Nov. 12-19
*Philadelphia, Pa., Automobile Show, Nov. 12-19
*San Francisco, Calif., Automobile Show .....Nov. 12-19
Boston, Mass., Automobile Show, Nov. 12-19
Los Angeles, Calif., Automobile Show, Nov. 12-20
*St. Louis, Mo., Automobile Show, Nov. 12-20
*Elmira, N. Y., Automobile Show, Nov. 14-19
New Haven, Conn., Automobile Show, Nov. 14-19
Indianapolis, Ind., Automobile Show, Nov. 19-25
Baltimore, Md., Automobile Show, Nov. 19-26
Rochester, N. Y., Automobile Show, Nov. 19-26
Montreal, Canada, Automobile Show, Nov. 19-26
*Washington, D. C., Automobile Show, Nov. 19-26
*Cincinnati, Ohio, Automobile Show, Nov. 20-26
Newark, N. J., Automobile Show, Nov. 26-Dec .3
Kansas City Automobile Show, Nov. 26-Dec. 3
National Motor Show of Canada, Toronto, Ont. .....Nov. 26-Dec. 3
Denver, Colo., Automobile Show, Dec. 5-10

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1939 Models Prices Reduced by Buick

Substantial price reductions on Buick cars for 1939, ranging from $51 to $102 on the standard sedan and coupe models, have been announced by Harlow H. Curtice, president of this division of General Motors.

The Buick price list, compared with 1938 prices follows:

Model	1939	1938
41 Four-door touring sedan ..	$996	$1,047
46 Business coupe	894	945
46S Sport coupe (opera seat)..	950	1,001
48 Two-door touring sedan ..	955	1,006
46C Convertible coupe (opera seats)	1,077	1,103
41C Sport phaeton	1,406	1,406
61 Four-door touring sedan..	1,246	1,297
66S Sport coupe (opera seats).	1,175	1,226
68 Two-door touring sedan...	1,205	1,256
66 Convertible coupe (opera seats)	1,343	1,359
61C Sport phaeton	1,713	1,713
81 Four-door touring sedan, with trunk	1,543	1,645
87 Four-door touring sedan..	1,543	1,645
81F Formal sedan	1,758	1,758
81C Sport phaeton	1,983	1,983
91 Six passenger four-door touring sedan	2,074	2,176
90 Eight-passenger touring sedan	2,350	2,350
90L Limousine	2,453	2,453

The Crosley Rumors

Persistent rumors that Crosley Radio Corp. of Cincinnati would soon undertake production of a small Diesel-powered passenger car became more rife when it was announced recently that stockholders had authorized deletion of "Radio" from the company name. In a telegram to AUTOMOTIVE INDUSTRIES, Powell Crosley, Jr., president, states, "Change of corporation name by elimination of radio due to general diversification of business in progress several years. Light transportation venture purely personal one over period of last 20 or more years. Whether or not corporation will eventually become interested in same depends on further developments of personal experimental work," Mr. Crosley added that there was no immediate prospect of the corporation manufacturing a small automobile.

Production

(Continued from page 389)

week went to a two shift basis to increase its daily output to more than 900 units. According to H. H. Curtice, president of the Buick division, daily output will average 1100 units as production gets into full swing. Total output of all General Motors divisions for the week is estimated at 14,500 units.

All Chrysler divisions also were reported to be completing final assemblies and accounting for approximately 6800 of the week's total. The balance was provided by Packard, Hudson, Studebaker and miscellaneous producers.—J. A. L.

Duryea Dies

(Continued from page 393)

of a dollar of fixed purchasing power, instead of a dollar whose purchasing power fluctuates with the value of gold. He was also a champion of the League of Nations and of prohibition, and "Letters to the Editor" from his pen appeared in the Philadelphia papers at frequent intervals.

It has been a puzzle to many that Charles Duryea, who made such a brilliant start in the automobile business, should have been so unsuccessful as a manufacturer in his later years. Throughout the period he lived in Philadelphia he was in straitened circumstances, and he once confided to the writer that he often did not know "where tomorrow's meals were to come from." However, he never bewailed his fate or blamed others for his reverses. On the contrary he was usually of quite buoyant disposition. He took great satisfaction in whatever public recognition was accorded him for his pioneer work in automobile development, as when the Kiwanis Club at Springfield in 1937 erected a tablet bearing the following inscription: "Springfield, Birthplace of the Automobile Industry—America's First Gasoline Buggy Had Its Pulling Test on April 19, 1892, at 47 Taylor Street—Springfield, Massachusetts, Honors Charles E. Duryea, Father of the Automobile." It seems that by nature he was of the type of the pioneer and the crusader, and he lacked the elements essential to success in business. The Duryea car which won the *Times-Herald* contest was a very business-like looking vehicle, and the fact that it won would indicate that mechanically it was in the van of progress. Later vehicles turned out by Duryea sometimes seemed to be regressions rather than advances. Of course, in his early work he was associated with his brother Frank, who later did very creditable work as chief engineer of the Stevens-Duryea Company. Apparently in his later operations Charles Duryea did not have the cooperation of equally capable associates.

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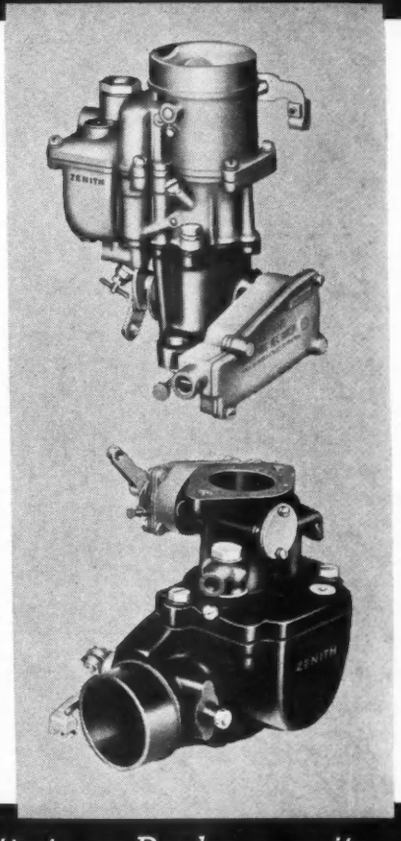

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ZENITH CARBURETOR DIVISION

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Trade Study Underway

Associations Sent Questionnaires in First Phase of Investigation

American business will be studied by the Temporary National Economic Commission to determine why the country as a whole has not had a fuller utilization of our resources, Leon Henderson, executive secretary, told the Trade Executives Association of New York on Tuesday.

"There is nothing advantageous to the American people in the policies of the totalitarian countries of Japan, Germany and Italy," he said. "The commission expects to find an answer to the lack of coordination, and will seek to report ways to achieve stabilization of industry," he told the trade association managers.

The first step was sending a questionnaire to 2300 of the 8200 trade associations in the country. He said that although the committee had power to subpoena data, that the trade associations would cooperate in filling out the questions.

Dr. Willard Thorpe, economist for Dun & Bradstreet, Inc., in charge of this phase of the inquiry, pointed out that no one knows what the American business structure really is, and agreed with Mr. Henderson that nothing could be done to eliminate the ups and downs of business, or to modify their disasterous effects, until information was gathered on business as a whole.

"This inquiry is neither an attack nor a defense of American business. We must have the facts, and Congress has empowered the commission to get them," he said.

This first step, Calvert Judkins, of the U. S. Department of Commerce, said, will be the first census ever made of trade associations. The importance of the trade association movement in this country, as shown by the large number of such groups, demands such a study. Leading industrialists, he said, had lent every possible assistance to getting this census.

Stability, Mr. Henderson said, is essential to American business, and is the only possible basis for long-term planning.

The commission, authorized by an act of Congress, is composed of three Senators, three Representatives, and six Government executive agencies. The act empowers the commission to draw on the experience and findings of any other governmental agency to help round out a complete picture of the process of American Government.

Field investigations will be made. Speakers pointed out that the inquiry would be of inestimable benefit to industry, and Mr. Henderson expressed the hope that cooperative policies of industries would result from the reports to be made.

"There is nothing narrow, or of a witch-burning character, in this job. Our job is simply to bring about a greater understanding to bear on the problem of utilizing the nation's resources to the best advantages to all Americans," he said.

The T. A. E. voted by acclamation to cooperate in the study.

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LAKE SHORE DRIVE • CHICAGO

Cars Financed in Canada During August Totaled 13,748

A total of 13,748 new and used cars were financed in Canada for $5,673,207 in August, as against 16,018 at $6,377,109 in the previous month, and 15,485 at $6,366,700 a year ago. In the first eight months of 1938, a total of 119,304 vehicles were financed for $51,567,071, against 135,781 at $57,607,040 in the same period of 1937.